THE OIL WEEKLY

ENGINEERING « NEWS » STATISTICS

EDITORIAL STAFF
WARREN L. BAKER
Editor

J. KENT RIDLEY
Managing Editor

ASSOCIATE EDITORS
L. J. LOGAN — BRAD MILLS
WM. V. GROSS

DISTRICT EDITORS
B. F. LINZ.....Washington
BEN ALTMAN, FRANK TAYLOR.....Tulsa
H. H. KING.....Fort Worth
EARL S. POST.....San Antonio
R. W. BYRAM.....Austin
CHAS. LEYENDECKER, WM. H. STRANG, Z. H. MISCHKA.....Houston

PUBLISHED BY
THE GULF PUBLISHING COMPANY
HOUSTON, TEXAS

R. L. DUDLEY, *President*
A. L. BURNS, *General Manager*
S. W. ROBINSON, *Editorial Director*

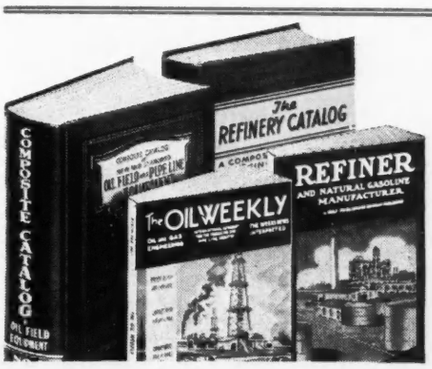
Staff correspondents at all important points.

Member Audit Bureau of Circulation
Member Associated Business Papers, Inc.

BRANCH OFFICES
NEW YORK.....250 Park Ave.
PITTSBURGH.....Vandergrift Bldg.
CHICAGO.....332 S. Michigan Ave.
LOS ANGELES..W. W. Wilson Bldg.
Huntington Park, Calif.
TULSA.....Hunt Bldg.
FORT WORTH.W. T. Waggoner Bldg.
SAN ANTONIO.....Smith Young Tower Bldg.
WASHINGTON.....Albee Bldg.

ADVERTISING STAFF
DICK SWINSKY.....New York
C. A. WARDLEY.....Pittsburgh
H. G. FITZPATRICK.....Chicago
J. F. CARTER, JR.....Tulsa
JAY CURTS, JR.....Los Angeles
CHAS. WYATT.....Houston

CIRCULATION DEPARTMENT
J. T. WAGONER.....Manager



SPECIALIZED OIL JOURNALS
Published by
THE GULF PUBLISHING COMPANY

The Oil Man's Calendar

FEB.	
12–15	**American Institute of Mining & Metallurgical Engineers, New York.**
MAR.	
14–15	**American Petroleum Institute, Mid-Continent District, Division of Production, Wichita, Kansas.**
28–29	**American Petroleum Institute, Southwestern District, Division of Production, Houston, Texas**
31	**Western Petroleum Refiners Association, Wichita, Kansas.**
APR.	
10–12	**American Association of Petroleum Geologists, Chicago.**
11–12	**American Petroleum Institute, Eastern District, Division of Production, Columbus, Ohio.**
18–19	**National Petroleum Association, Cleveland, Ohio.**
MAY	
18–25	**International Petroleum Exposition & Congress, Tulsa.**
26–27	**Petroleum & Natural Gas Conference, State College, Pa.**
27–31	**American Petroleum Institute, Mid-Year Meeting, Ft. Worth, Tex.**

Contents « January 15, 1940

Volume 96, Number 6

This Week's Panorama..... 11

Feature Section:

December Spurt Brings Year's Drilling Near 1938..... 12
BY L. J. LOGAN

Mississippi Looms as Nation's Major 1940 Geophysical Play..... 15
BY DR. JOHN D. TODD

Chemical Removal of Paraffin from Pumping Wells.... 22
BY G. F. WILLIAMS AND DR. F. N. ALQUIST

Rhodes Pool Repressuring Showing Quick Profit..... 28

News Section and News Index..... 37

Looking Ahead with the Editor..... 4

Letters..... 6

Notes for the Equipment Buyer and User..... 69

Squeaks from the Bull Wheel..... 73

Advertisers' Index..... 74

Published every Monday. Single Copies 15 cents (Special Issues 50c). Subscription price: domestic and foreign, $2.00 a year; 2 years $3.00. Entered as second-class mail matter December 23, 1916, at the post office at Houston, Texas, under act of March 3, 1879. Subscription restricted to those engaged in the producing and pipe line branches of the oil industry or the manufacturing and distribution of oil field supplies. Advertising rates on application.

Copyrighted 1940, by The Gulf Publishing Company.

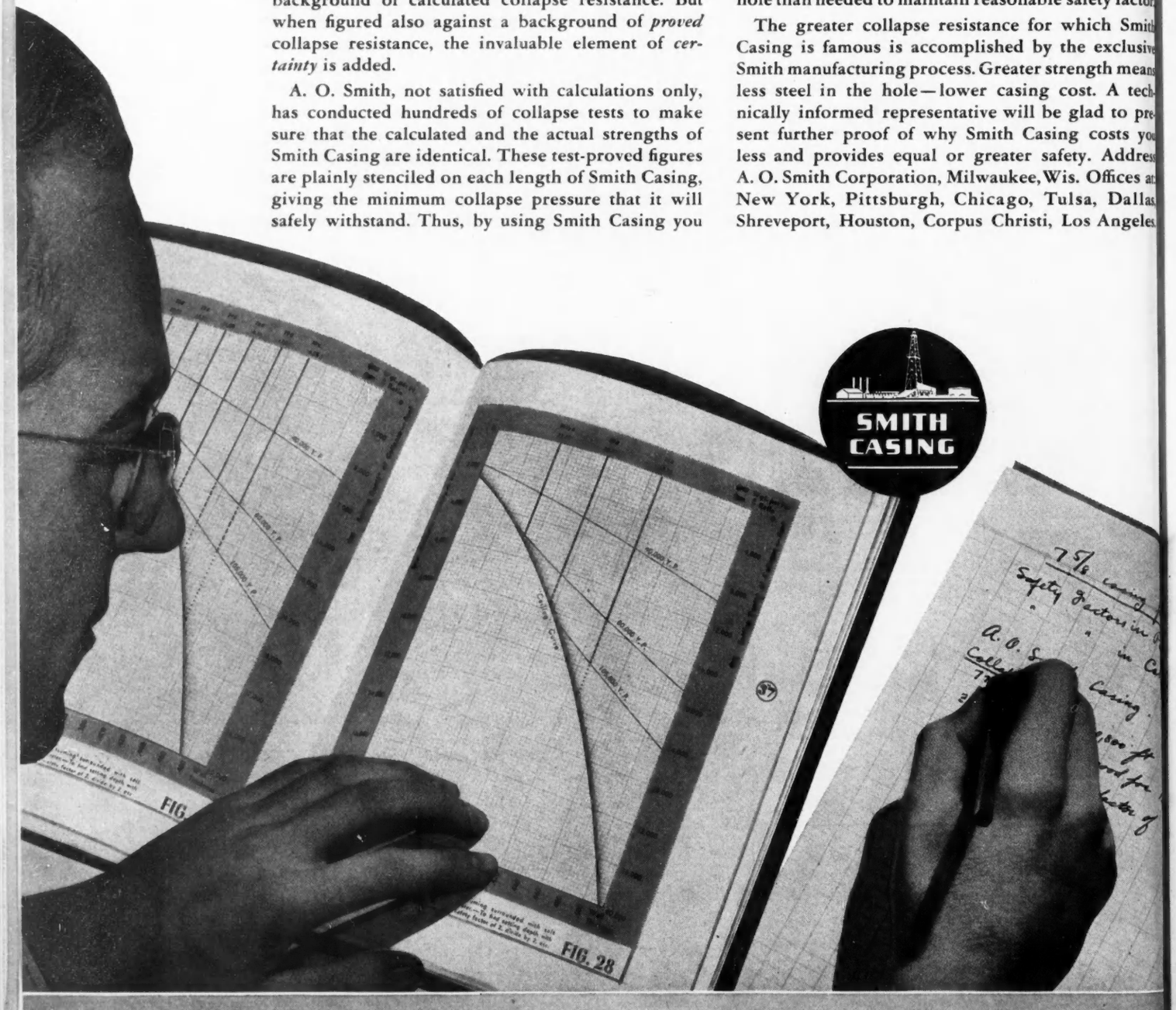
SMITH Testing

Backs Up the Engineer's Pencil!

The casing for a hole is naturally figured against a background of calculated collapse resistance. But when figured also against a background of *proved* collapse resistance, the invaluable element of *certainty* is added.

A. O. Smith, not satisfied with calculations only, has conducted hundreds of collapse tests to make sure that the calculated and the actual strengths of Smith Casing are identical. These test-proved figures are plainly stenciled on each length of Smith Casing, giving the minimum collapse pressure that it will safely withstand. Thus, by using Smith Casing you avoid the unnecessary expense of more steel for the hole than needed to maintain reasonable safety factor.

The greater collapse resistance for which Smith Casing is famous is accomplished by the exclusive Smith manufacturing process. Greater strength means less steel in the hole—lower casing cost. A technically informed representative will be glad to present further proof of why Smith Casing costs you less and provides equal or greater safety. Address A. O. Smith Corporation, Milwaukee, Wis. Offices at New York, Pittsburgh, Chicago, Tulsa, Dallas, Shreveport, Houston, Corpus Christi, Los Angeles.



A.O.SMITH
CORPORATION
Milwaukee, Wisconsin

MANUFACTURERS OF ELECTRIC-WELDED

Casing

Pressure Vessels • Line Pipe

THE OIL WEEKLY

JANUARY 15, 1940

VOLUME 96 NUMBER 6

The Week's Panorama

DESPITE trouble with gasoline inventories, sentiment in the petroleum industry is predominantly cheerful, most oil men expecting 1940 to be generally satisfactory.

Demand Outlook . . . . .

A further substantial increase in demand for petroleum and products in 1940 is generally anticipated. Larger domestic consumption appears assured; and although the wars have obscured the outlook for foreign business, exports are expected to compare favorably with those in 1939. Thus total demand appears headed for a new all-time peak in 1940, following the breaking of all previous records in 1939.

All Oils; Gasoline . . . . .

Total demand for all products in 1940 is being estimated from 4 to 7 percent higher than in 1939. The gain in 1939 over 1938 was about 7 percent, but some doubt that such a rate of expansion will be maintained.

Gasoline demand is expected to increase 3 to 5 percent for the year, and has been officially estimated up 5 percent for the first quarter by the Bureau of Mines. The increase for 1939 over 1938, similarly, was about 5 percent.

Lubricants Wanted . . . . .

Estimators do not like to be too specific in forecasting demand for lubricants in 1940, although generally agreed that the market requirement will be up materially. The demand in 1939, stimulated greatly in the latter half of the year by the sharp increase in industrial activity and by the wars abroad, was more than 15 percent larger than in 1938. And lately, the markets have been absorbing around 50 percent more than at the corresponding time a year earlier.

Heating Oil . . . . . .

Following the setting of a new record in 1939, with a 14 percent increase over 1938, demand for heating oil is expected to keep on growing. The gain for 1940 is being estimated as at least 6 percent, and some anticipate a further increase of 10 to 12 percent. Justifying optimistic expectations is the fact that a record number of oil burners is in use, while new burners are being installed in relatively great numbers.

Industrial Oil . . . . . .

After having increased over 10 percent in 1939, in response to brisk industrial activity and the movement of large quantities of goods by boat and rail, demand for industrial fuel oil is expected to show a further gain of at least 4 or 5 percent in 1940. That would mean the setting of a new all-time record.

Refinery Runs Cut . . . . . .

As if it had just made a New Year's resolution to practice moderation, the industry curtailed refinery runs in the week ended January 6, with some beneficial effect on excessive gasoline stocks.

Crude runs to stills were reduced 75,000 barrels to 3,370,000 barrels daily, and then were only 6.3 percent larger than at the corresponding time a year earlier. Previously, runs were about 10 percent greater than one year before.

Gasoline Situation . . . . . .

In consequence of the curtailment of refinery operations, gasoline production was 34,000 barrels a day smaller in the week ended January 6 than in the previous week.

That reduction held the week's addition to stocks down to approximately 1,000,000 barrels, in contrast with the 2,000,000-barrel addition the week before.

However, even a 1,000,000-barrel addition each week for the 12 weeks until the end of March would result in an inventory of 94,000,000 barrels on March 31; whereas most economists think that about 82,000,000 barrels would be adequate as working stocks when spring demand begins to eat into storage.

Heating Oil Stocks . . . . . .

While the cutting down of refinery runs arrested additions to gasoline stocks, it also reduced refinery output of heating oils. Meanwhile, market demand for those oils was stimulated by cold weather. Consequently, the relatively large amount of about 2,000,000 barrels came out of gas oil and distillate fuel storage. The remaining supply of 32,183,000 barrels was 9.6 percent smaller than that held a year before. Thus the heating oil inventory is remarkably light, considering the current large consumption.

Heavy Oil Storage . . . . . .

Stocks of industrial fuel oils also were drawn upon heavily, nearly 1,500,000 barrels having been taken out of storage in the week of January 6. The 105,247,000-barrel supply of residual fuel oil that was left was 10.8 percent smaller than that held a year before, whereas demand is considerably better.

December Spurt Brings Year's Drilling Near 1938 Level

By L. J. LOGAN, Associate Editor

WHEREAS drilling normally declines seasonally in December, it increased materially in the final month of 1939, further reflecting the brisk general business activity and the improved markets for refined products and crude oil.

Having expanded about 12 percent from the November proportions, field development in December was the greatest for the year. Well completions were the most numerous since November, 1937, and thus were near all-time record levels.

After having averaged 80.4 daily in November, United States completions jumped to 90.5 in December, an increase of 12.5 percent. The December, 1939, drilling was 17.1 percent greater than that in December of 1938, when completions averaged 77.3 daily. It was 6.1 percent above that in December, 1937, in which month new wells were finished at the average rate of 85.3 daily.

The December activity was only about 10 percent under the peak levels of the summer of 1937, which were around the highest in the history of the industry. In June, July, August, September and October of 1937, completions of United States wells averaged around 100 a day.

Year's Decline Small

The sharply increased field work of October and November and the further spurt in December made the 1939 record of completions closely approach that for 1938.

United States completions in 1939 totaled 26,542, or 3.6 percent less than the 27,523 of 1938, according to this publication's preliminary figures, subject to minor revisions.

The drilling of 1939 was even closer to that of 1936, when 26,935 new wells were completed in the country.

The busiest year for the past two decades was 1937, when there were 33,112 completions, according to THE OIL WEEKLY's compilations. And the most active year in the history of the industry was 1920, when 33,911 completions were reported by the Bureau of Mines.

December Results

The increase of drilling in December was general in scope, a majority of the states having shown gains, while decreases were limited and small.

In response to the sharp improvement in Pennsylvania grade crude prices in recent months, drilling increased in December in Pennsylvania, West Virginia, New York, and Ohio.

Illinois and Kentucky also recorded further increases in field work, although Indiana showed a slight decline, as did Michigan.

In the Mid-Continent, increases in drilling occurred in most states. Kansas completions jumped from 119 in November to 149 in December. Those in Oklahoma rose from 161 to 200. Other increases included: North Louisiana, from 32 in November to 43 in December; South Louisiana, from 82 to 93; and Texas, from 724 to 812, with all districts of the state except North Texas showing gains. Arkansas and New Mexico had slightly fewer completions in December than in November.

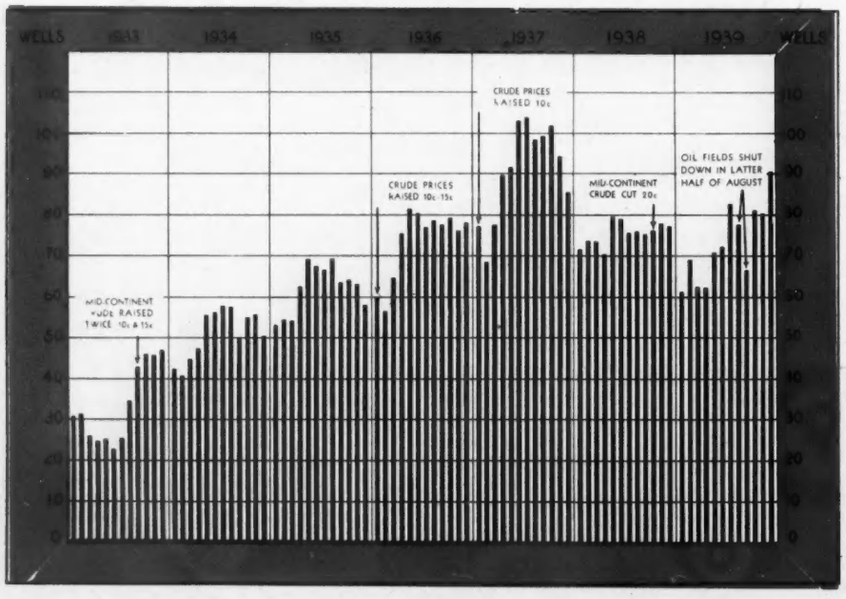
Presented herewith are figures showing the amount of drilling that has occurred in December in each of the years from 1933 through 1939.

December of:	Average Number of Wells Completed Daily
1933	47.0
1934	50.2
1935	58.0
1936	78.0
1937	85.3
1938	77.3
1939	90.5

Although the United States as a whole showed the 3.6 percent decrease in drilling in 1939, various states and districts were more active than in 1938.

Average Number of Wells Completed Daily in U. S.

(By Months, January, 1933-December, 1939)



Illinois, which gained momentum as the year progressed, was still showing an upward trend in drilling as the year ended, and furnished in December a record number of monthly completions, 395 new wells having been completed, as compared with 371 in November. Illinois ended 1939 far ahead of any other state except Texas in recorded completions. The 3806 new wells for the year were almost double the 2032 of 1938, and they represented 40 percent as many completions as there were in big and oily Texas.

Indiana Active

Encouraged by the success in Illinois in finding new fields, operators drilled aggressively also in the adjoining state of Indiana, which similarly furnished nearly twice as many completions in 1939 as in 1938. The 294 new Indiana wells in 1939 compared with 163 in 1938, an 80.5 percent increase. (Kentucky failed to fulfill expectations, and showed a 17.7 percent decrease in completions in 1939, instead of a gain, as the number of new wells dropped to 657 from 798.)

Michigan Work Up

Michigan was another state that showed an exceptional increase in drilling in 1939. The 1455 new wells for the year were 45.3 percent more numerous than the 1002 of 1938.

The relative importance which Michigan assumed is indicated by the fact that the state furnished more new wells than Kansas or Louisiana and nearly as many as Oklahoma or Pennsylvania.

Responsible for the brisk drilling in Michigan was the finding and development of the new, shallow fields of the southwestern part of the state. Moreover, the crude market was relatively strong, and prices were sufficiently good to encourage drilling.

Rocky Mountain States

Although the Middle West furnished the year's most noteworthy increases in drilling, development was up materially also in the Rocky Mountain States.

Montana was particularly active, having supplied 152 new wells in 1939, as compared with 79 in 1938, almost a 100 percent increase. Colorado showed an increase that was nearly as great, relatively. The state's 19 completions for 1939 compared with 11 in 1938. Wyoming's drilling was up 18.2 percent, as completions rose to 129 from 109.

The increased field work in the Rocky Mountain region resulted from enlarged markets for crude, as new pipe lines and new refineries were put into operation.

Mid-Continent Drilling

Although drilling ran generally below the 1938 curve in most Mid-Continent states in the greater part of 1939, the pick-up in the closing months was sufficient to swell the year's completions above those in 1938 in several states and districts.

Arkansas ended the year with 229 new wells on record, against 225 for 1938, an increase of 1.8 percent. Louisiana accounted for 1176, or 9.6 percent more than the 1073 of 1938, as a 30.9 percent de-

1939 Completions 3.6 Percent Under 1938 Total; Production Up 3.4 Percent

STATE OR DISTRICT	DECEMBER, 1939, COMPLETIONS AND CRUDE OIL PRODUCTION*						COMPLETIONS AND PRODUCTION IN 12 MONTHS, 1939 AND 1938								
							WELLS COMPLETED			DETAILS OF 1939 DRILLING				BARRELS PRODUCTION		
	Total Wells	Oil	Gas	Dry	Initial Production	Production for December	1939: 12 Mo.	1938: 12 Mo.	Percent Change	Oil	Gas	Dry	Initial Production	1939: 12 Months	1938: 12 Months	Percent Change
Arizona							3					1				
Arkansas	13	8	1	4	3,807	2,167,150	229	225	+ 1.8	181	5	43	110,182	21,244,850	18,338,750	+ 15.8
California	98	87	2	9	79,696	18,988,150	1,037	1,270	— 18.4	838	17	182	452,528	225,056,950	250,286,000	— 10.1
Colorado						122,750	19	11	+ 72.5	7	2	10	966	1,401,900	1,407,500	— 0.4
Eastern States	928	652	108	168	104,919	3,225,700	8,664	7,271	+ 19.1	5,845	1,201	1,622	1,228,436	†35,974,850	58,051,850	
Illinois	395	314	2	79	99,913	10,464,350	3,806	2,032	+ 87.4	3,027	25	754	1,164,378	89,642,600		
Indiana	41	19	7	15	2,759		294	163	+ 80.5	135	28	131	39,500			
Kentucky	63	29	7	27	933		657	798	— 17.7	269	98	290	13,615			
New York	§92	92			436		§672	§676	— 0.6	632	27	17	2,610			
Ohio	§104	27	46	31	329		§991	923	+ 7.4	262	458	271	3,881			
Pennsylvania	§160	156	3	1	166		§1,623	§2,000	— 18.8	1,408	148	67	2,155			
West Virginia	73	15	43	15	383		621	679	— 8.5	112	417	92	2,297			
Kansas	‡149	108	5	36	a120,856	5,465,700	‡1,450	‡1,644	— 11.8	1,022	66	362	a2,138,859	57,944,300	58,784,250	— 1.3
Louisiana	136	83	10	43	24,116	8,433,650	1,176	1,073	+ 9.6	769	53	364	228,526	94,625,850	95,204,300	— 0.7
North Louisiana	43	22	8	13	4,134	2,150,650	351	508	— 30.9	216	29	106	62,986	25,096,200	28,327,350	— 12.8
South Louisiana	93	61	2	30	19,982	6,283,000	825	565	+ 46.1	553	14	258	165,540	69,047,700	66,876,950	+ 3.3
Michigan	116	67	3	46	20,169	2,056,250	1,455	1,002	+ 45.3	839	58	558	372,552	23,250,600	18,975,300	+ 22.2
Montana	19	16		3	1,525	538,250	152	79	+ 92.5	116	9	27	12,914	5,577,250	4,859,500	+ 14.4
Nebraska						100	2	1	+ 100.0	1		1	150	100		
New Mexico	55	46		9	24,070	3,382,600	654	534	+ 22.4	553	12	89	273,301	34,025,250	37,616,200	— 9.9
North Dakota								1								
Oklahoma	‡200	112	16	72	32,623	13,290,800	‡2,081	‡2,087	— 0.3	1,240	148	693	391,209	152,596,600	170,208,100	— 10.3
Southeastern States	6	3		3	1,604	55,350	55	24	+ 130.0	14		41	4,608	85,300		
Alabama							1	1				1				
Florida																
Georgia							1					1				
Mississippi	6	3		3	1,604	55,350	20	21	— 4.8	7		13	3,768	85,300		
Tennessee							33	2	+1550.0	7		2	840			
Texas	812	602	25	185	336,185	45,701,600	9,436	12,188	— 22.6	6,700	277	2,459	4,801,227	482,807,730	474,706,650	+ 1.7
East Texas Field	20	20			25,719	14,124,550	425	1,806	— 76.5	417		8	1,483,646	142,665,350	149,986,350	— 4.9
Rest of East Texas	22	12	5	5	1,996	2,841,650	303	488	— 38.0	130	32	141	41,947	33,195,000	34,380,900	— 3.2
North Texas	163	116		47	76,588	2,793,750	1,714	2,399	— 28.5	1,065	9	640	643,525	27,182,200	26,703,250	+ 5.5
South Texas	219	149	6	64	48,895	7,030,050	2,710	2,744	— 1.2	1,771	79	860	667,429	81,918,600	82,569,500	— 0.8
Corpus Christi Area	102	81	3	18	40,397		1,326	1,216	+ 9.5	1,002	45	279	542,601			
Laredo Area	91	56	2	33	7,983		1,001	1,057	— 5.3	604	28	369	111,441			
San Antonio Area	26	12	1	13	515		383	471	— 18.7	165	6	212	13,387			
Texas Gulf Coast	98	76	5	17	25,487	7,627,750	1,291	1,525	— 15.3	980	48	263	297,089	79,006,750	74,195,850	+ 6.5
Texas Panhandle	56	45	6	5	17,605	2,448,700	453	571	— 20.6	347	82	24	126,175	24,164,330	24,009,200	+ 0.6
West Texas	174	155		19	133,135	7,859,900	2,045	2,289	— 10.7	1,796	4	245	1,453,673	80,540,050	72,211,650	+ 11.5
West Central Texas	60	29	3	28	6,760	975,250	495	366	+ 35.2	194	23	278	87,743	10,975,945	10,649,950	+ 3.1
Utah								4								
Wyoming	3	3			4,925	2,012,550	129	109	+ 18.2	93	10	26	95,506	22,112,550	19,184,000	+ 15.3
Total United States	2,535	1,787	170	578	754,495	115,302,850	26,542	27,523	— 3.6	18,218	1,845	6,479	10,110,964	1,248,884,950	1,207,622,450	+ 3.4

* December completions cover not the calendar month, but the four weeks, or 28 days ended December 23.
† Does not include Illinois.
§ Includes water-input wells, classified as oil wells.
‡ Includes salt water disposal wells.
a Consists largely of potentials arrived at not by actual test, but by fluid-level metering, and productivity index calculations.

Number of Drilling Rigs in Field January 1 Near Peak Level

STATE OR DISTRICT	TOTAL RIGS IN OPERATION (Drilling, Rigs Up, Shut-Down)				DETAILS OF JANUARY 1, 1940 DRILLING ACTIVITY					
					Rigs in Operation			Prelim. Activity		
	Jan. 1, 1940	Dec. 1, 1939	Jan. 1, 1939	Percent Change from Year Ago	Drilling	Rigs Up	Shut-down	Derricks	Locations	Total Operations
Arkansas	32	8	39	— 18.0	21	1	10	4	3	39
Arizona	8	42	4	+100.0	4	...	4	...	1	9
California	314	273	304	+ 3.3	213	58	43	45	44	403
Colorado	34	33	24	+ 41.5	7	1	26	...	2	36
Eastern States	886	901	867	+ 2.2	520	113	253	107	99	1,092
Illinois	318	372	372	— 17.2	142	48	128	52	51	421
New Fields	198	242	262	— 24.4	101	40	57	41	39	278
Rest of Illinois	120	130	110	+ 9.1	41	8	71	11	12	143
Indiana	65	67	36	+ 80.5	50	5	10	12	7	84
Kentucky	67	66	84	— 20.2	20	14	33	10	7	84
New York	62	60	33	+ 88.0	26	13	23	4	4	70
Ohio	121	130	125	— 3.2	79	12	30	9	4	134
Pennsylvania	165	159	141	+ 9.9	141	7	17	12	16	193
West Virginia	88	97	76	+ 10.5	62	14	12	8	10	106
Iowa	2	2	...	...	1	...	1	...	...	2
Kansas	236	228	168	+ 40.4	188	23	25	13	9	258
Louisiana	205	214	200	+ 2.5	186	9	10	22	45	272
North Louisiana	70	80	98	— 28.6	60	...	10	7	7	84
South Louisiana	135	134	102	+ 25.0	126	9	...	15	38	188
Michigan	243	228	159	+ 52.7	138	40	65	7	7	260
Missouri	22	22	...	...	10	2	10	1	1	24
Montana	40	47	42	— 4.7	20	1	19	1	2	43
Nebraska	2	10	...	...	1	1	...	...	...	2
New Mexico	150	168	141	+ 6.4	100	5	45	2	19	171
North Dakota	...	...	...	...	...	...	...	...	...	...
Oklahoma	346	347	295	+ 17.3	239	47	60	40	29	415
Oregon	1	1	...	...	...	...	1	...	...	1
South Dakota	2	2	...	...	2	...	...	...	...	2
Southeastern States	50	38	19	+163.0	19	11	20	4	3	57
Alabama	2	2	5	— 60.0	...	...	2	1	...	3
Florida	3	3	5	— 40.0	...	...	3	...	...	3
Georgia	1	...	...	...	...	...	1	...	...	1
Mississippi	36	24	9	+300.0	14	11	11	3	3	42
Tennessee	8	9	...	...	5	...	3	...	...	8
Texas	1,268	1,300	1,098	+ 15.5	990	91	187	57	331	1,656
East Texas Field	14	12	39	— 64.0	3	3	8	2	2	18
East Texas Border Counties	10	9	23	— 56.7	4	1	5	...	...	10
Rest of East Texas	43	37	27	+ 59.2	26	4	13	3	2	48
North Texas	194	225	145	+ 33.8	145	11	38	8	86	288
South Texas	309	301	310	— 0.3	245	25	39	17	65	391
Corpus Christi Area	166	163	155	+ 7.1	142	11	13	8	34	208
Laredo Area	78	76	87	— 10.3	59	8	11	7	23	108
San Antonio Area	65	62	68	— 4.4	44	6	15	2	8	75
Texas Gulf Coast	159	169	128	+ 24.2	148	5	6	18	72	249
Texas Panhandle	120	121	72	+ 66.5	97	13	10	...	14	134
West Texas	311	339	282	+ 10.2	259	18	34	9	68	388
West Central Texas	108	87	72	+ 50.0	63	11	34	...	22	130
Utah	8	3	1	+700.0	4	1	3	...	...	8
Washington	1	...	...	...	...	...	1	...	...	1
Wyoming	74	64	72	+ 2.8	43	4	27	2	3	79
Total United States	3,924	3,981	3,434	+ 12.5	2,706	408	810	305	598	4,827

crease in North Louisiana was more than compensated by a 46.1 percent increase in South Louisiana. The new wells in the northern part of the state declined to 351 in 1939 from 508 in 1938, but those in the Gulf Coast district rose to 825 from 565.

Although Texas as a whole had 22.6 percent less drilling in 1939 than in 1938, there were increases of 35.2 percent in West Central Texas and 9.5 percent in the Corpus Christi area of Southwest Texas.

Rigs in Operation

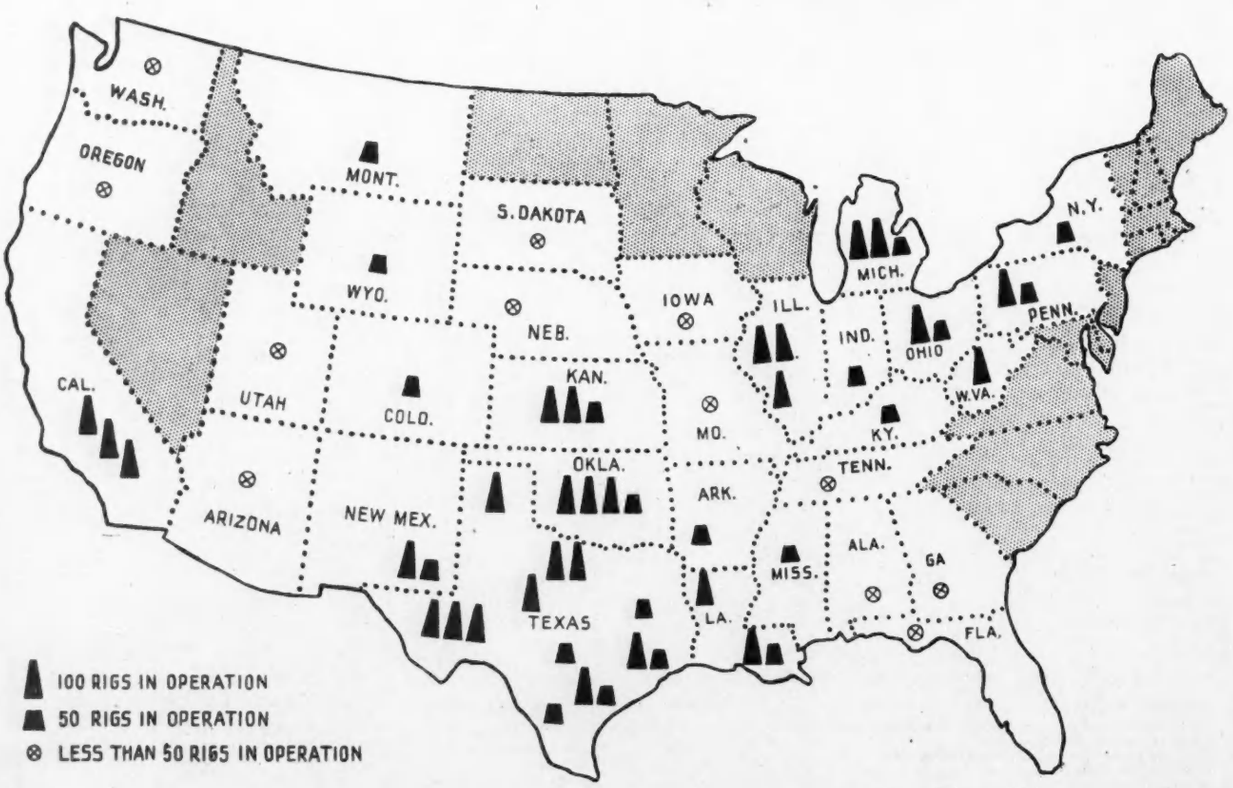
Figures on current drilling activity supplied by this publication's staff men indicate that January, like December, will furnish a relatively large number of well completions.

Drilling rigs in operation in the United States on January 1 totaled 3924, according to the survey, as compared with the 1939 peak of 3981 on December 1.

The active operations on January 1, 1940, were 12.5 percent more numerous than the 3434 of January 1, 1939.

The above figures include wells drilling, rigging up, and temporarily shut down.

The January 1, 1940, total of 3924 operations included 2706 wells drilling, 408 rigging up, and 810 shut down.



Picture Courtesy McCollum Exploration Co.

A typical modern geophysical crew laying geophones preparatory to taking a record "Somewhere in Mississippi."

Mississippi Looms As Nation's Major 1940 Geophysical Play

By DR. JOHN D. TODD*

AS THE oil industry moves into the Forties, the States of Mississippi has raced to the foreground of exploration activities. With the opening of a new decade has come a new province for exploration and development, perhaps to remain the focal point of interest for some years in the future.

From a development angle, the State of Mississippi has always been neglected badly by the oil companies; and if real intensive development had been dependent on the oil companies, it might still be in the doldrums. The finding of oil in Mississippi was entirely an accident; an accident wholly unanticipated by the drilling company.

The drilling of the Tinsley structure was a part of a development program carried on by the gas companies, in search of a gas field. The rapid decline of the Jackson gas field had made it apparent that another gas field would have to be found, or a long, expensive line built to tap the large reserve farther west. A large market for gas exists in the Southeastern States, but no natural gas has as yet been discovered there; this market had been supplied by the Jackson gas field throughout the thirties, but for the last two years the Jackson field has been approaching exhaustion.

The Tinsley structure was drilled in search of gas, as were a number of other wells which show on the map of Mississippi in the name of United Gas Company and Southern Natural Gas Company. All those wells were drilled in the hope that another large gas reserve, similar to Jackson, would be discovered and the cost of the long, large pipe line would be saved. So in that sense the discovery well at Tinsley was a failure—the gas line had to be built anyway! (The fact that the

* Roper and Todd, Consulting Geologists, 527 Esperson Bldg., Houston, Texas, 610 Tower Bldg., Jackson, Miss.

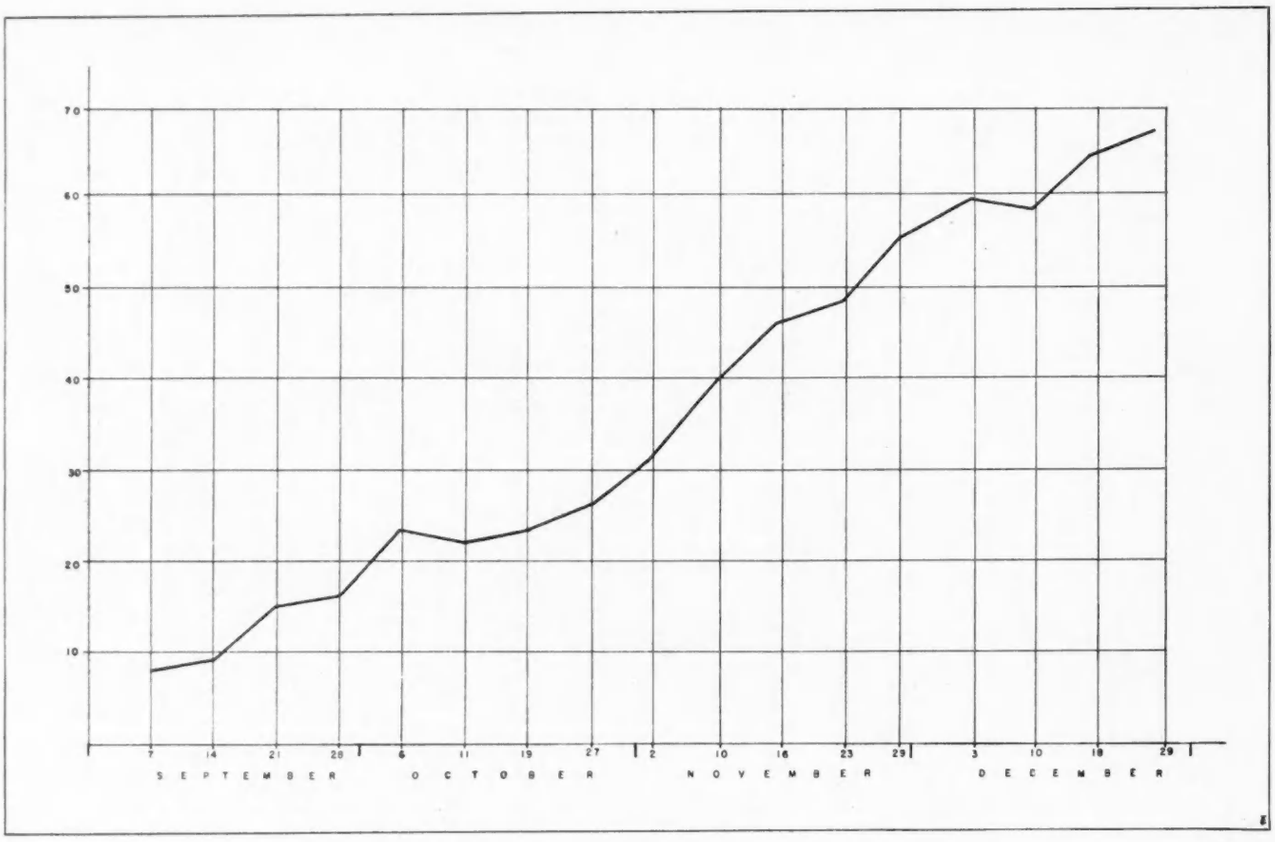


FIGURE 1
Trend of geophysical crew operating in Mississippi-Alabama Area

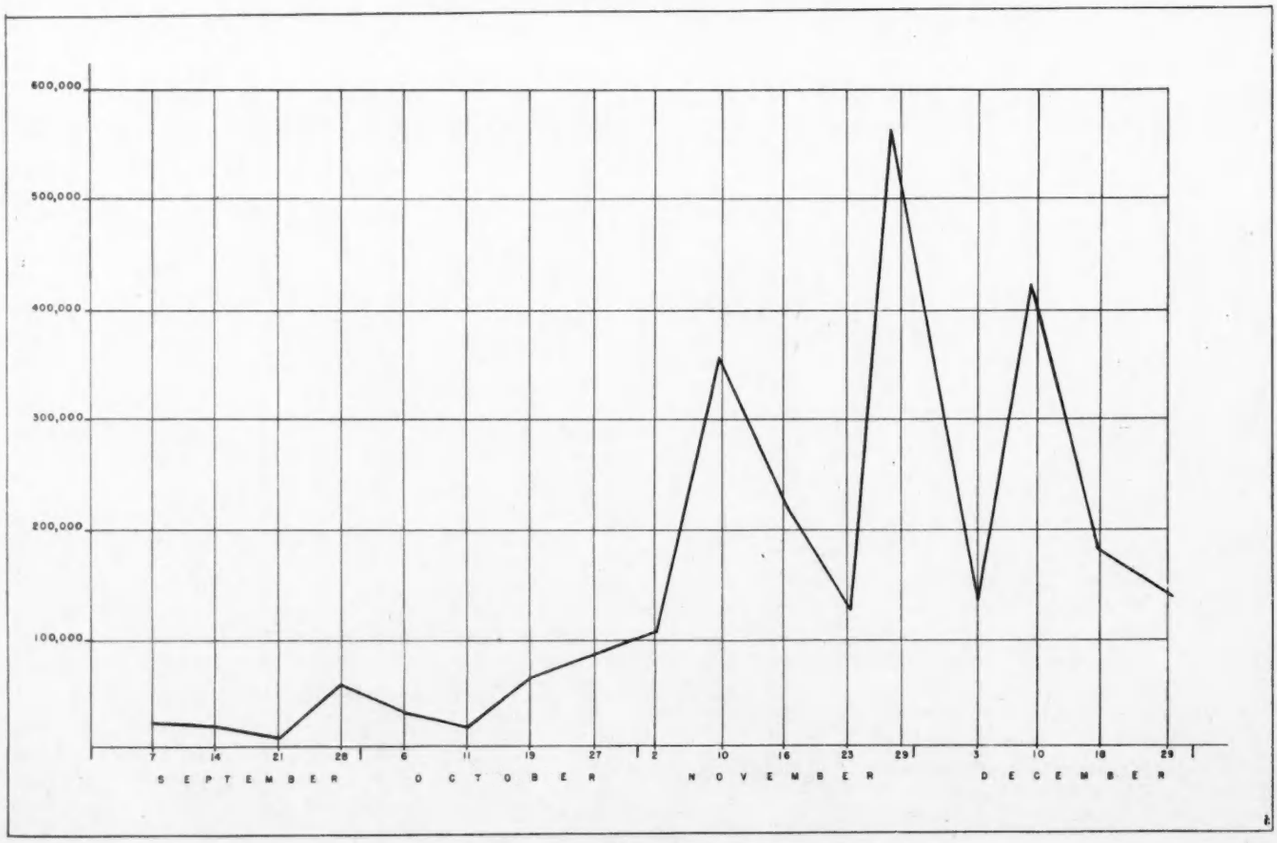


FIGURE 2
Trend of acreage purchased in Mississippi-Alabama Area by weeks

Tinsley field will pay for the line might help some.)

The finding of oil in Mississippi at once focused the eyes of the entire industry on the state, and those skeptics who waited for further drilling at Tinsley have been able to plot up on their maps a large and profitable oil field. The shift of the companies' attention to Mississippi has been made easier by the fact that exploration in other areas, by present known methods, has been yearly becoming less profitable due to the "Law of Diminishing Returns." Seismic crews are considered fortunate to find one prospect a year on the Coast, while a prospect each season is expected of a Mississippi crew.

The Trek Is On

The possibilities of so large and meagerly explored a state as Mississippi are too great to be ignored; and even those who are not really convinced of the potentialities of the area, must take some protective steps in that direction. The rising interest in the state, since the opening of the Tinsley field, as evidenced by the increase in geophysical work is graphically shown as Figure 1 (the steady increase reminds one of the rumored Gusher in Hades). The high of 63 crews was attained the last week in December. As the geophysical crews are the eyes of the oil companies, it is not hard to determine in which direction they are now looking, when so many crews are daily working in the Mississippi-Alabama area.

The extent to which this interest has crystallized into the buying of leases, is shown on Figure 2, in terms of acres per week. The high point, to date, of 550,000 acres in one week was reached for the week ending December 29, 1939. The total reported leased acreage since the Tinsley discovery amounts to 2,520,000 acres, and approximately 1,500,000 acres was under lease when oil was discovered in the state. There are approximately 30,000,000 acres of land in the State of Mississippi.

Which companies are interested in the area is reflected through the names of those who have geophysical parties there, as shown on Figure 3. An inspection of this list will disclose almost all the majors and many of the more active independents taking a hand in the play. In addition to those actively engaged in geophysical work and leasing, there is the usual large percentage of those who at this stage are content to "watch and

FIGURE 3

Companies Maintaining Geophysical Crews in Mississippi-Alabama Area (Listed by companies, type and location)

COUNTY	COMPANY	Party Chief	Type Instrument	AREA
Adams	Fohs	Goetsch	Gravimeter	T. 5 N., R. 2 & 3 W.
Attala	Stanolind	Thomas	Seismograph	T. 14 & 15 N., R. 6 E.
Carroll	Exchange	Snow	Seismograph	T. 18 & 19 N., R. 2 & 3 E.
Copiah	S. W. Wheeles	Neal	Seismograph	T. 10 N., R. 2 W.
Hinds	Wilmut	Cooper	Seismograph	T. 6 N., R. 1 W.; T. 7 N., R. 1 E.
Hinds	Tatum, Shattock & Dunbar	Crawford	Seismograph	T. 4 & 5 N., R. 2 W.
Hinds	Magnolia	Roper	Gravimeter	T. 5 & 6 N., R. 1 W.
Hinds	Cities Service (?)	Haynes	Gravimeter	T. 3, 4, & 6 N., R. 4 W.
Holmes	Kingwood	Hazelwood	Magnetometer	T. 13 N., R. 3 E.
Holmes	Arkansas Fuel Oil	Horn	Seismograph	T. 14 N., R. 1 & 2 W.
Humphreys	Pure	Kennedy	Seismograph	T. 10 N., R. 2 W.; T. 13 & 14 N., R. 3 & 4 W.
Humphreys	Pure	Shugart	Seismograph	T. 14, 15 N.; R. 3 W. T. 15, 16 N., R. 4 W.
Jasper	Sun	Bills	Gravimeter	T. 1 N., 10, 11 E.; 10 N., 11, 12, 13 W.
Jasper & Smith	Magnolia	Granberry	Gravimeter	T. 2 N., R. 8, 9, 10, 11 E.
Lauderdale	Westbrook & Thompson	Manes	Seismograph	T. 6 N., R. 16 E.
Lawrence	Sun	Henshaw	Gravimeter	T. 6 N., R. 10, 11 E.
Leake	Cities Service	Pattison	Gravimeter	T. 10 N., R. 6, 7 E.
Lee & Monroe	Carter	Zimmerman	Seismograph	T. 11, 12 S. R. 6 E.
Lincoln	California	Lukens	Seismograph	T. 5 N., R. 9 E.
Leake	Phillips	Johnson	Seismograph	T. 10 N., R. 7, 8, E.
Madison	Carter	Dale	Seismograph	T. 8, 9 N., R. 4, 5 E.
Madison & Yazoo	Exchange	Hammond	Gravimeter	T. 11, 12 N., R. 3, 4 E.
Madison	Arkansas Fuel Oil	Donnelly	Gravimeter	T. 9 N., R. 3 E.
Madison	Johnson & Johnson	Rosentcrans	Seismograph	T. 10, 11 N., R. 3, 4 E.
Perry & Forrest	Fohs	Stokely	Seismograph	T. 1 S., R. 11, 12 W.; 1 N., 10, 11 W. 2 N., 10 W.
Rankin	Stanolind	Jackson	Gravimeter	T. 3, 4 N., R. 4, 5 E.
Rankin	Carter	Owens	Gravimeter	T. 5 N., R. 4, 5 E.
Scott	Exchange	Winfree	Seismograph	T. 5, 6 N., R. 8 E.
Scott	Carter	Stoker	Gravimeter	T. 7 N., R. 6 E.
Sharkey	Wilmut	Gaby	Seismograph	T. 14 N., R. 6 W.
Simpson	Fohs	Hughes	Gravimeter	T. 2 N., R. 5, 6 E.
Simpson	Magnolia	Brogan	Gravimeter	T. 1 N., R. 2 & 3 E.
Smith	Gulf	Ferrick	Seismograph	T. 1 N., R. 8 & 9 E.
Warren	Magnolia	Lester	Seismograph	T. 14, 15 N., R. 4 E.
Washington & Sunflower	Atlantic	Holstead	Magnetometer	T. 14, 17 N., R. 5, 7 W.
Washington	Fleetborn	Luckie	Seismograph	T. 17 N., R. 7, 8 W.; 18 N., 6 W.; 18, 19 N., 7W.
Washington	Magnolia	Mayes	Gravimeter	T. 18, 19 N., R. 6, 7 W.
Wilkinson	Humble Oil	Trigg	Gravimeter	T. 2 N., R. 2 W.
Yazoo	Phillips	Lee	Seismograph	T. 12 N., R. 2, 3 E.
Yazoo	Exchange	Kittredge	Seismograph	T. 13 N., R. 1 E.
Yazoo	Amerada	Burton	Seismograph	T. 11 N., R. 1 E. & 1 W.
Yazoo & Holmes	Carter	Reiss	Seismograph	T. 12, 13 N., R. 2, 3 E.
Yazoo & Holmes	Carter	Rich	Gravimeter	T. 14 , 15 N., R. 3, 4 E.
Yazoo & Holmes	Kingwood	Wasthersby	Seismograph	T. 12 N., 2, 3 E.
Yazoo & Madison	Conoco	Jordan	Gravimeter	T. 10 N., R. 3 W., 7, 8, 9 N., 1, 2 E.
Alabama	Amerada	Lawrence	Seismograph	Christmas vacation.
Alabama	Gulf	Kilbourne	Magnetometer	Christmas vacation.
Alabama	Gulf	Bartles	Gravimeter	Christmas vacation.
Alabama	Gulf	Du Pont	Seismograph	Reported moving to Alabama.
Alabama, Fayette & Walker	Stanolind	Powell	Magnetometer	T. 13-15 S.; 9, 10 W.
Alabama, Fayette & Walker	California	Mosher	Gravimeter	On Christmas vacation.
Alamana, Fayette & Walker	California	Smith	Gravimeter	On Christmas vacation.
Alabama, Fayette & Walker	Cities Service	Medsger	Gravimeter	No report.
Alabama, Fayette & Walker	Gulf	Fair	Gravimeter	On Christmas vacation.
Alabama, Fayette & Walker	Gulf	Gunn	Gravimeter	On Christmas vacation.
Alabama, Fayette & Walker	Evans		Magnetometer	No report.
Alabama, Fayette & Walker	Miss. B. O. & G	Burrough	Gravimeter	On Christmas vacation.
Alabama, Fayette & Walker	Exchange	Gill	Gravimeter	On Christmas vacation.
Alabama, Fayette & Walker	Exchange	Hamil	Seismograph	Moved to Clinton.
Alabama, Fayette & Walker	Arkansas Fuel Oil	Henshaw	Gravimeter	On Christmas vacation.
Alabama, Fayette & Walker	Shell	Courson	Gravimeter	No report, Christmas vacation.
Alabama, Fayette & Walker	Shell	Walker	Seismograph	No report, Christmas vacation.
Alabama, Fayette & Walker	Plymouth Oil	Wade	Seismograph	Christmas vacation.

wait." The large amount of capital in this later category was amply evidenced by the presence of 125 geologists at the first 1940 meeting of the Mississippi Geological Society at Jackson on January 3, 1940. (The Mississippi Geological Society is a child of Tinsley born in November, 1939; on January 1, 1939 the American Association of Petroleum Geologists listed *four* geologists in Mississippi.)

The location of the various crews in the different counties of the state is shown as Figure 4, which indicates the areas in which interest is at present the keenest.

The general structure of the State of Mississippi is the eastern side of a geosyncline, formed by the Mississippi Embayment. With this larger feature are associated smaller basins as the Yazoo Basin, the western part of the Warrior Basin, the southern part of the Memphis Basin, and no doubt others as yet unknown.

The petrolific possibilities of such basins have recently been demonstrated in the Illinois Basin, the San Joaquin Valley, the Forrest City Basin and closer to home in the Miocene fields of the South Louisiana Basin. The recent large reserve additions from such other basins, in part accounts for the relatively rapid recognition of Mississippi's potentialities by those accustomed to move slowly.

The extensive exploration of such basins has been a recent development, and came more of necessity than of choice; exploration having been carried to the fruitless stage on the geoanticlines and ridges. In the earlier days, when it was supposed that oil migrated for great distances, it was believed that oil would probably not accumulate on a structure in a basin. For this reason the early exploration was concentrated on regional highs —as witness the early oil fields on the Cincinnati Arch, the La Salle Anticline, the Nemaha Ridge and the Sabine Uplift. In such earlier days, when geology was confined to surface mapping, the high places were in fact better areas for exploration since erosion was more active there and contacts were better exposed.

More recently, we have learned through forced prospecting that structures in a basin do accumulate oil; and that they are in fact quite as satisfactory reservoirs as those on ridges. And in recent years a means of prospecting these basins, where no surface evidence is apparent, has been developed to a state of near perfection . . . i.e., geophysics.

FIGURE 4

Map showing types and locations of geophysical crews by counties in Mississippi

Geophysics Comes of Age

Since geophysics came to the aid of the oil industry, some 17 years ago, its chief function has been to find more oil fields in areas where oil fields already existed; and to find additional structures similar to known producing structures.

In exploring of basins, geophysics has so matured that it is now able to go into areas where there are no oil fields and find oil fields —as has been the case not alone in Mississippi but in Nebraska and Missouri as well. The geophysicist is now able to go into areas where it is not known what kind or

amount of structure is required to produce oil, and to find structures that do produce oil. It is fortunate for Mississippi that the first real systematic exploration of the state comes at a time when geophysics have advanced to a stage where they can accurately map the subsurface of practically every area.

Very great and unrecognized advances have been made in the design, the manufacture and the use of geophysical equipment even within the past few years. Equipment has been made smaller, lighter, more sensitive and more selective; with the consequence that perfect results can now be obtained in many areas where no usable records were secured before. Field techniques have been greatly improved, so that crews move into Mississippi with a background of experience at overcoming unfavorable conditions. All the older forms of geophysics, seismic gravity and magnetic, have been yearly improved; and new methods such as soil analysis have been developed.

The geophysical industry moves into Mississippi with 1940 model equipment that has been streamlined in the interest of greater efficiency, and this streamlining has been carried through to the amount of party personnel and equipment. Now parties operate with less equipment and fewer men, and yet in the more favorable areas of Mississippi get as many points as they formerly did. The advantages of the gravimeter in lowering the cost of gravity work has been widely publicized, but the recent decrease in cost per acre of seismic work is not so well known.

The scramble for the Mississippi business by the more active geophysical companies is no doubt in part the cause of the lower prices; and economies have been effected and profits reduced, as is characteristic of a maturing business. In sum it means, that a greater amount of work can be accomplished with any given geophysical budget. For Mississippi this means that a greater amount of work will be done in the state, that the work will be better done, and that more results will be obtained than at any previous time in the history of the oil industry.

Real Assistance

The Mississippi Geological Survey at University, Mississippi, has been of invaluable service to all oil operators coming to the state, and thus indirectly to all the landowners of the state. Under the learned supervision of Dr. W. C. Morse, whose broad and deep knowledge of the geology of Mississippi is built on years of study, the Survey has published authoritative texts on the geology of the state, and have collected a vast amount of general geological data. This general data is of greatest assistance to the small operator who does not have the funds or facilities available for the compilation of such necessary factual information on the entire state.

The field work of the Survey is under the personal direction of the learned Frederick F. Mellen, and a

Taking of records in areas previously considered "bad shooting country" is now possible with late model geophysical equipment. Modern equipment is the result of years of field experience and enables operators to take records faster and better.

Pictures Courtesy of Geophysical Service, Inc.

staff of competent assistants. This organization might well claim credit for the first oil field in Mississippi, since it was through their surface mapping that the Tinsley structure first came to public attention. It is true that the Tinsley dome was checked as to subsurface extent with seismograph before drilling; but it is also true that a well drilled on the *Moody Branch Inlier,* as mapped by the field party of the Survey, would have been an oil well without the benefit of geophysics.

Other areas of probable structural deformation have been mapped by the Survey at Glass in Warren County, at Sartartia in Yazoo County, at Blakely in Warren County, and at Alamucha in Lauderdale County. It is probable that one of these will prove productive before the end of the year.

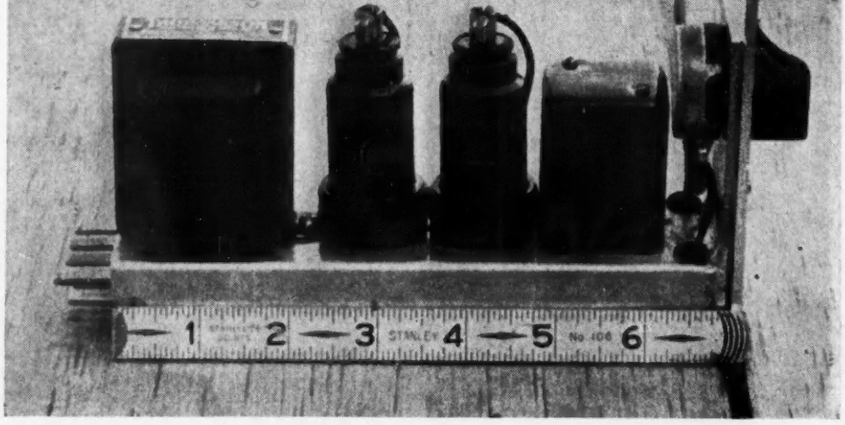
Mapped Accidentally

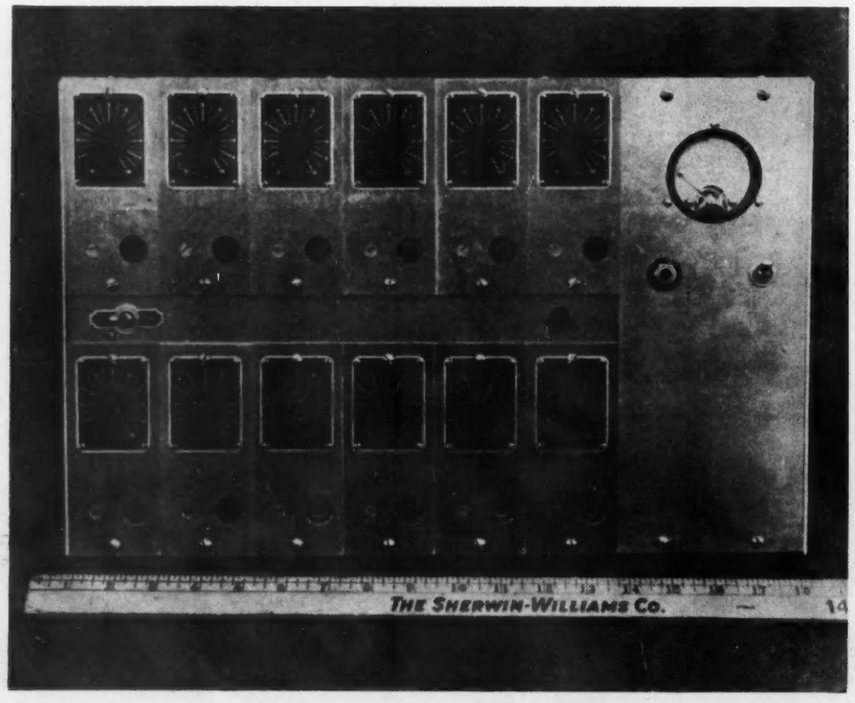
As the finding of oil in Mississippi was the accidental by-product of a gas company's drilling of Tinsley in search of gas, just so its mapping was the accidental by-product of the mapping of the county in search of clays and bentonite. The location of all the structures so far reported by the Survey have been the result of a mapping of the state in search of commercial clays and bentonite; this is a part of the State of Mississippi's program for industrialization, and is supported in part by Federal funds. It has been said that the Tinsley oil field is the only thing that the Federal Adminstration ever did for the oil industry, and it was quite unintentional. But unintentional as it was, it is probably true that the discovery of oil in Mississippi might have been deferred many years if it had been forced to await such detailed surface mapping by the oil companies.

In mentioning the assistance that has been extended to those engaged in the exploration of Mississippi's oil possibilities, it would be unjust not to include the state government and the citizenry of the entire state. Taxes in the state are low, proration is just, and regulations are reasonable. Permits to do geophysical work are universally granted by property owners, and work along the highways is permitted. In short, every conceivable assistance is being extended to the operator to help him find that elusive substance oil.

(To be concluded in the next issue)

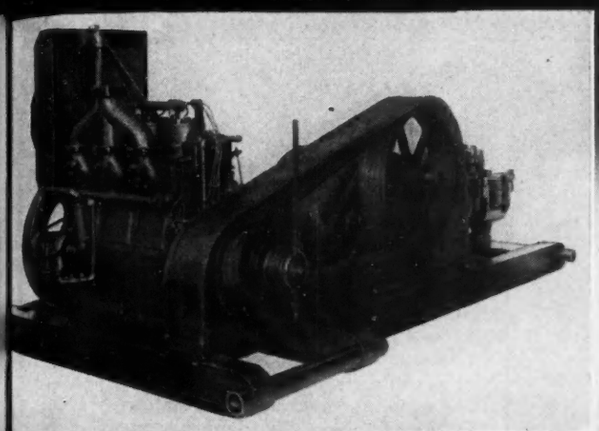
In the final part of the above article (to be published next week) Dr. Todd will include a brief survey of the current geophysical methods in use in Mississippi, with comments on the advantages and deficiencies of each. Some examples of recent geophysical work will be included, and suggestions as to some of the geophysical problems of the State of Mississippi will be given.

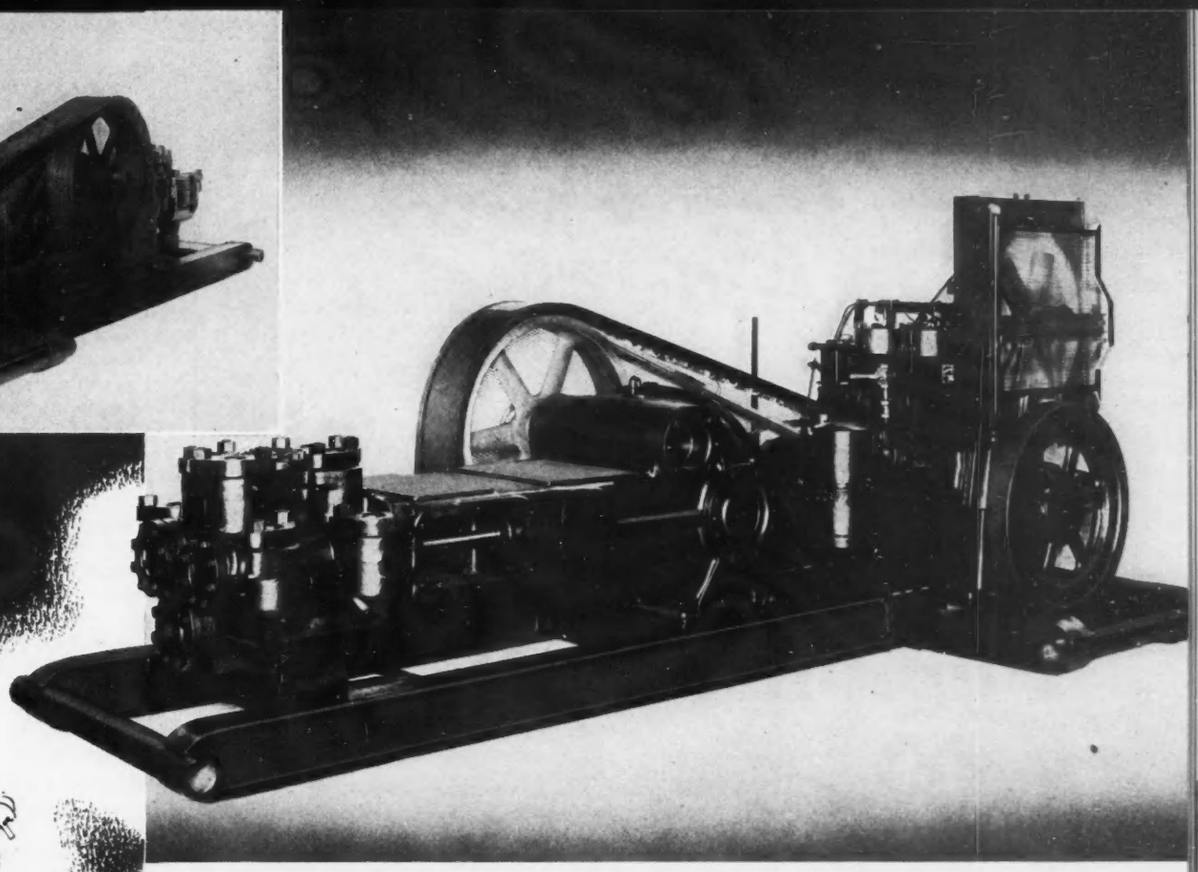


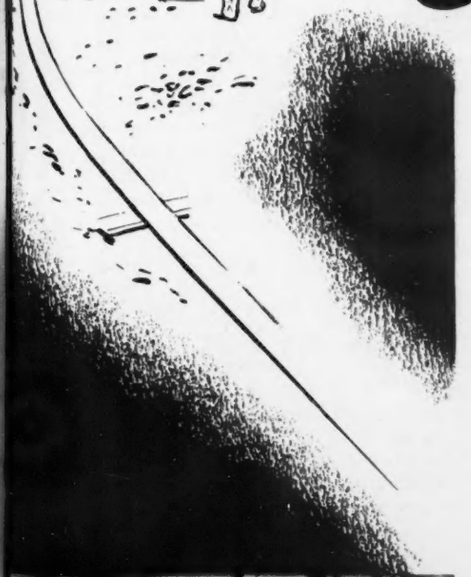


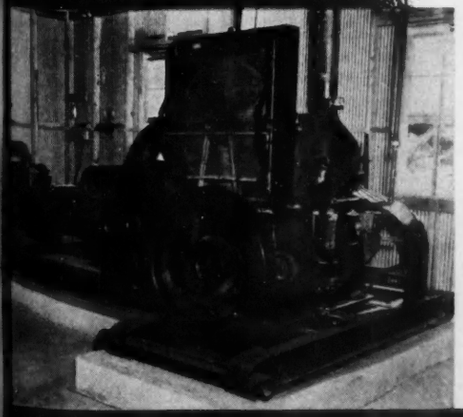
Modern geophysical instruments are lighter, more portable, more sensitive, and more expensive than ever before.

—Pictures Courtesy Hoard Exploration Company









CUT YOUR PIPE LINE COSTS

WITH A *Convertible Gas-Diesel* ENGINE

FAIRBANKS-MORSE Model 34 Engine and Fig. 6184 Power Pump

100% SALVAGEABLE • QUICKLY INSTALLED • HIGHLY EFFICIENT

Here is a well-balanced pumping unit that will cut costs in pipe line stations.

Mounted on strong steel skids, this unit may be used without a permanent foundation. It can be transported from one location to another with minimum trouble—making the unit ideal for either temporary or permanent lines of less than 6000 barrels per day capacity with lengths under 50 miles.

With the stamina of a heavy-duty Diesel engine, the F-M Model 34 Engine incorporated in this unit also has the advantages of a multi-cylinder engine. Its sturdy construction makes it especially suited for twenty-four hour operation. The F-M Fig. 6184 Power Pump is provided with heavy-duty, Alemite lubricated roller bearings, herringbone gears, and has the very latest modern design for highly efficient operation.

Continental engineers will gladly consult with you on your pipe line problems. Call Continental and talk things over.

THE CONTINENTAL SUPPLY COMPANY

General Offices: DALLAS, TEXAS

Export Office: CONTINENTAL EMSCO CO., Inc.
30 Rockefeller Plaza New York City, N. Y.

Representatives:

LONDON TRINIDAD MARACAIBO TAMPICO BUENOS AIRES

"Serving the Oil and Gas Industries"

CONTINENTAL

Pumping Series Article No. 33.

Chemical Removal of Paraffin from Pumping Wells

By G. F. WILLIAMS,
Dowell, Incorporated, Tulsa, Oklahoma
and
DR. F. N. ALQUIST,
The Dow Chemical Company, Midland, Michigan

PARAFFIN DEPOSITS in pumping wells always have been a problem to the oil operator. Although the daily accumulation of paraffin deposits upon the tubing walls and sucker rods is slight, in a short time the deposit can build up to such proportions that serious damage is done, and expensive repairs are necessary. The tubing may become plugged to the extent that the rods cannot fall through, resulting in the polish rod being bent or broken. Other damages caused by paraffin deposits in pumping wells are excessive pump cup wear, parted sucker rods, failure of working barrels, bursted tubing or possible overloading of pumping equipment in general. All add materially to lifting costs.

Also, production gradually may decrease. Sometimes oil that might otherwise have been lifted is lost as a result of partially plugged tubing, because only a small amount of oil, and this with a high gas content, can be produced. This tends toward early depletion of reservoir energy.

Paraffin deposits in pumping wells results from various conditions. The first and most important reason is general loss of temperature of the crude oil as it comes up the tubing. The bottom-hole temperature is generally higher than the well head temperature, especially in winter. As the crude is raised to the surface the temperature of the fluid becomes constantly lower until paraffin starts to congeal in the solution, and to build into a plastic mass upon rods and tubing.

The second main cause is the wetting and drying effect upon the tubing walls and sucker rods, when the well flows by heads or "agitates." Also, when the shutting down of the well over periods of time permits the oil to leak back past the pump, the oil level recedes down the hole, and paraffin is deposited.

It is necessary that this paraffin accumulation be removed regularly from the tubing or prevented from forming in it. There are two methods of accomplishing this desirable action, namely by chemical and mechanical means.

The accompanying article is the second of a series of two articles on removal of paraffin deposits. It deals exclusively with chemical methods. The first article, published last week, was devoted to mechanical means of removing paraffin accumulations from pumping wells.

THE removal of paraffin from pumping wells by means of chemical solvents has been effected in so many areas under so many different conditions that the method definitely is past the experimental stage.

When oil operators first became interested in the chemical removal of paraffin from pumping wells, they experimented with natural derivates of oil, and sometimes oil itself, to remove these deposits. Oil cuts are still being used to some extent today, but generally speaking, they have been found ineffective because of their low specific gravity.

Their weakness is due to their light weight prohibiting proper contact with the paraffin deposit, this being particularly true of those of such a light character that they actually float upon ordinary crude petroleum. To overcome this disadvantage, a solvent heavier than oil is generally used. This is obtained by mixing a heavy commercial solvent with a carrying agent such as naphtha or gasoline so that the resulting mixture usually has a gravity of about 0.9 to 1.1.

The major use for solvents is their application to pumping wells without pulling rods or tubing. There are two types of wells in which solvent is used in this manner.

In the first type, considerable gas is pumped with the oil. When the well is shutdown and back pressure at the trap is released, the gas will push a quantity of oil up out of the tubing. This partial emptying of the tubing, due to releasing of back pressure, is a common occurrence. In such instances the stuffing box is simply lifted up and the solvent mixture is poured into the tubing between the polish rod and the tubing walls. This is the most desirable condition for the successful application of a chemical solvent. It has been found desirable to mix the heavy chemical solvent with sufficient carrying agent to bring the weight of the mixture down to about nine pounds per gallon, or somewhat heavier than the oil.

In the second type of well, there is insufficient gas produced with the oil to unload the tubing. Three methods of treatment may be used

Take Stock of Your Truck Needs ...Then Call in INTERNATIONAL

THERE is one line of trucks that meets every hauling requirement and gives you the greatest value per truck dollar:

That's the International line!

Whether you need light pickup trucks for utility work, medium heavy-duty trucks, or big heavy-duty trucks, there are Internationals to fit your job *exactly* . . . at the right price!

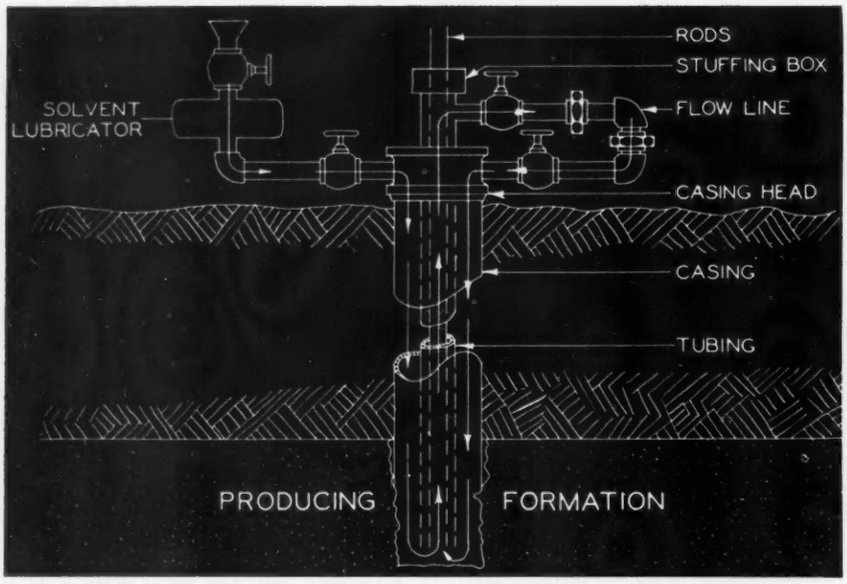
And as for truck value: One look at an International will show you they are sturdy, rugged trucks, built to take a lot of punishment throughout their long life. And when you get into the details, you really begin to appreciate the *quality* of International construction and the money-saving features engineered into these trucks . . . all designed to give owners the best in performance at low operating cost.

Ask the International dealer or Company-owned branch for a demonstration.

INTERNATIONAL

INTERNATIONAL HARVESTER COMPANY
(INCORPORATED)
180 NORTH MICHIGAN AVENUE CHICAGO, ILLINOIS

INTERNATIONAL TRUCKS



Arrangement at the well head for lubricating paraffin solvent into the well. Direction of introduced solvent and flow of production carrying both solvent and freed paraffin indicated by arrows.

on such a well. First, it is sometimes necessary to make room for the solvent by permitting the oil to run out at the lower end of the tubing. Consequently, the upper section of the tubing is emptied when the oil seeks its own level in the well. This may be accomplished first by pumping off the well, if it will pump off; second, by lifting the rods from 10 to 15 feet and unseating the standing valve at the bottom of the well; third, by pouring the solvent into the top of the tubing. Almost without exception, this procedure permits the oil to run out and makes room for the solvent to be introduced.

The second method of treating this type well makes use of about 25 feet of ⅜-inch copper tubing which is run down the well tubing beside the rods. The lower end of the copper tubing is mashed together in a chisel-like effect, and small holes are drilled in it for a distance of three to four feet. This keeps the paraffin from clogging up the end of the tubing and makes it easier to shove down the tubing beside the rods. A small funnel can be attached to the upper end of the ⅜-inch tubing for injecting the solvent. As the tubing fills with solvent, the displaced oil will run over at the well head as it is lighter than the solvent. Therefore, it is necessary that the copper tubing be of sufficient length that the calculated amount of solvent can be introduced without loss. After the solvent is introduced into the well, the oil floats up through the solvent as the solvent works down past the paraffin accumulation.

This method is not as popular as the first. Where it is employed, it is generally advisable to keep the solvent mixture heavy, as weight is necessary to penetrate the fluid column and permit the solvent to come into contact with the paraffin accumulation. For best results in treatments of this type, the solvent mixture should have a specific gravity of approximately 1.25, making the mixture weight at least 10 pounds per gallon. If a very heavy solvent is not used the treatment is useless.

The third or circulation method of treating a pumping well that will not unload itself involves the introduction of the solvent down the casing. The solvent mixture is introduced into the well by lubricator through the casing at the casing head without shutting the well down at any time. This method also is used to increase production by removing paraffin from the face of the oil producing section. The object is to introduce the solvent and wash it down the casing with crude oil. Then as it is pumped up the tubing with the oil,

Paraffin problems vary with field and individual well. There is no way to ascertain the extent of paraffin formation without cleaning out the well, as being done here. Discharged paraffin forms the mound about the casing in this instance.

it removes the paraffin from the tubing and holds the dissolved paraffin in solution. This method is used regularly to prevent paraffin accumulations from forming, or from becoming serious, by regular applications weekly or monthly as the operator finds necessary.

In this type of work the solvent mixture should be only slightly heavier than the oil in the well, so it will not float on the oil where possibly it might not be picked up by the pump. On the other hand, it should not be too heavy as it might go to the bottom of the well and stay indefinitely, since perforations in the tubing generally do not extend to the bottom of the hole. When there is no pressure on the casing head or gas escaping, the solvent is poured into the casing by inserting an ell into the casing head valve and pouring the solvent into the well. Where the well has pressure on the casing head, a lubricator is connected into the casing and the solvent is lubricated into the well under pressure and washed down with a barrel or two of crude oil.

In all applications of solvent made upon pumping wells without removing the rods, with the exception of the casing head injection method, it has been found desirable to allow the solvent to remain in the well approximately six hours while the rods are stationary. Then the pump should be started and the solvent pumped up to the well head and, when it is detected by its characteristic odor from the bleeder on the tubing, the well should be shut down so that the solvent may work back down the tubing. This action will work the dissolved paraffin loose and move it up the tubing, permitting fresh solvent to come into contact with undissolved paraffin. The second stage should take at least five hours, and longer if possible. The shutdown time naturally depends upon the particular condition of each well but generally speaking the above rule can be applied with success. Some one of the above methods may be applied to any conventional type of pumping well.

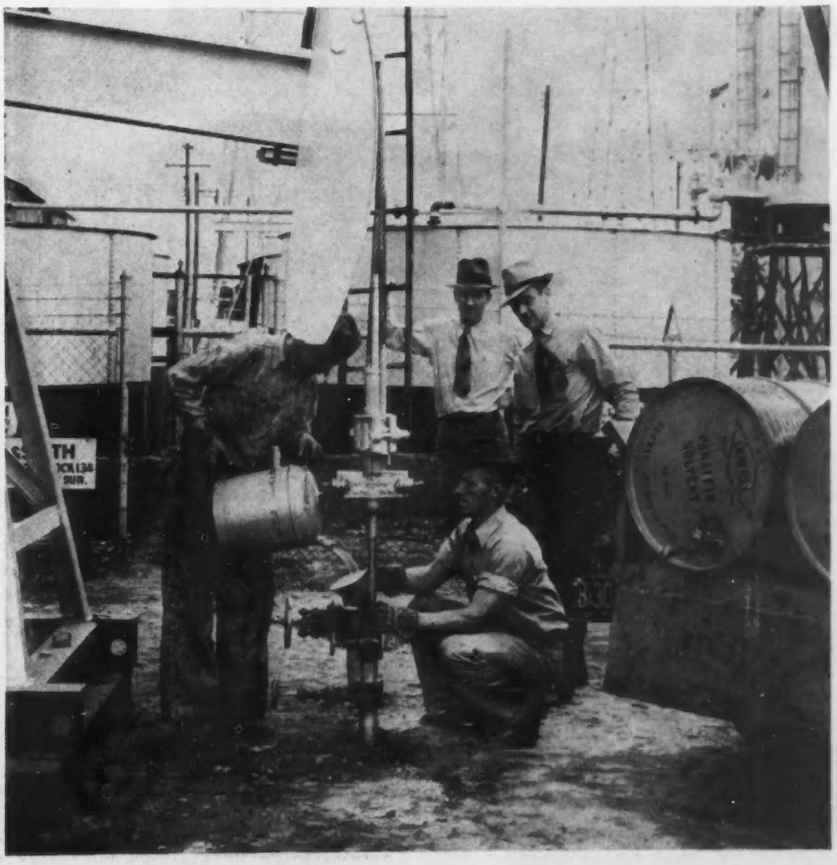
A Michigan operator has wells in North Buckeye, West Branch and Porter fields. The wells in all three of these fields paraffin up very badly but the West Branch and North Buckeye fields have the most serious troubles.

It was vitally necessary to remove paraffin accumulations before the wells could be successfully and economically produced. The company evolved a system which has proven entirely satisfactory, meeting the bad conditions existing in an economical manner.

Two gallons of solvent are introduced down the tubing every ten days. After standing over night, the well is then produced for ten days. At the end of this time, the rod string is raised and lowered as a precaution against paraffin plugging up the working barrel, after which the well is produced another ten days. Then again, two gallons of solvent are introduced with another ten days of production preceding the following rod pull. The entire treatment covers a forty-day period. By this means of removal the per well production was increased by holding down time to a minimum.

This is an example of successful application of solvent down the tubing. Experience shows that where possible the solvent should be put down the tubing in one application and circulated down the casing the next application as shown in accompanying illustration. However, circulating down the casing has the disadvantage of shutting down the well and changing the flow line back into the casing head. Many operators prefer to make all applications down the tubing and this is a choice to be made by them depending on local well conditions.

Another example illustrating the successful prevention of paraffin troubles in a pumping well is the history of solvent applications on a lease located between Pampa and Borger, in the Texas Panhandle. The practice is to first clean the tubing of all paraffin accumulations. Periodically, beginning the week following this cleaning of tubing, one gallon of solvent mixed with one gallon of naphtha, is introduced down the tubing. After each periodic treatment the well is allowed to set overnight after which regular production practices are resumed. Many of these wells so treated are pulled only to install new cups. Some of them have been pumped almost two years without pulling rods.



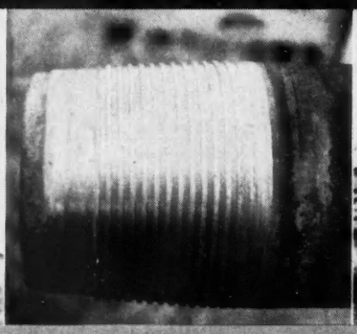
Introducing paraffin solvent into the tubing with rods in the hole after lifting the stuffing box.

NATIONAL

RENEWABLE IN THE FIELD . . .

Making longitudinal cuts 180° apart with acetylene equipment.

Wedging of two halves.



Appearance of the pipe end, displaying perfect threads and seal.

Cleaning pipe end with an electric wire buffing wheel.

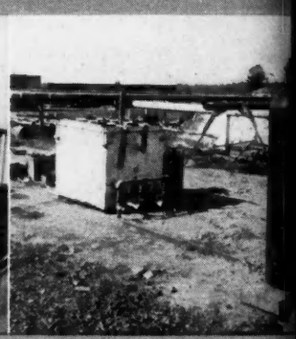
Tightening cold joint on pipe to attain proper cold position mark.

Gauging "Cold Position" of the cold tool joint for reference mark.

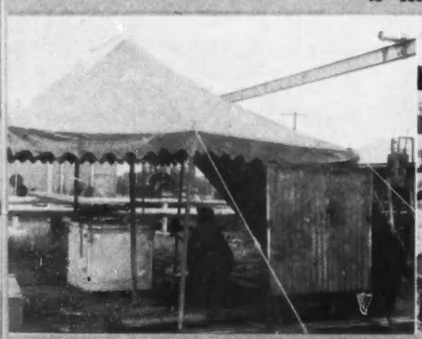
Gauging pipe for "Hot Position." This is done by placing one end of template at the "Cold Position" mark of the tool joint and marking the circumferential advance to "Hot Position."

Removing tool joint after marking pipe and tool joint with corresponding numbers to insure identical replacement after heating.

Loading or unloading the portable furnace with lifter and tool joint elevator.



Portable furnace is closed & locked during heating process. Temperatures are controlled by recording thermometers.



During inclement weather a tent is erected to protect the hot furnace.

Workman applying hot tool joint. Gauging position mark on the tool joint advances to the "Hot Position" mark on pipe.

THE EFFICIENCY OF THE FINISHED JOB IS EQUAL TO THAT OF A MILL APPLIED JOB

EXECUTIVE OFFICES
PITTSBURGH, PENNA.

•

GENERAL SALES OFFICE
TOLEDO, OHIO

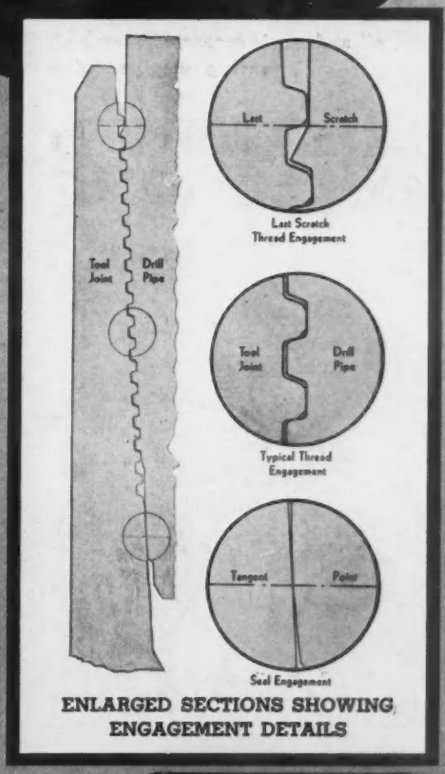
THE NATIONAL

L SHRINK THREAD TOOL JOINTS

POSITIVE ASSURANCE AGAINST LAST ENGAGED THREAD FAILURE-LEAKAGE AND WASHOUTS....

Plus...

SIMPLE AND ACCURATE FIELD RENEWAL WHICH ENTIRELY ELIMINATES WELDING HAZARDS AND THE POSSIBILITY OF GALLED THREADS



ENLARGED SECTIONS SHOWING ENGAGEMENT DETAILS

L SUPPLY COMPANY

DIVISION OFFICES
FT. WORTH, TEXAS
TULSA, OKLA.
TORRANCE, CALIF.

Rhodes Pool Repressuring Showing Quick Profit

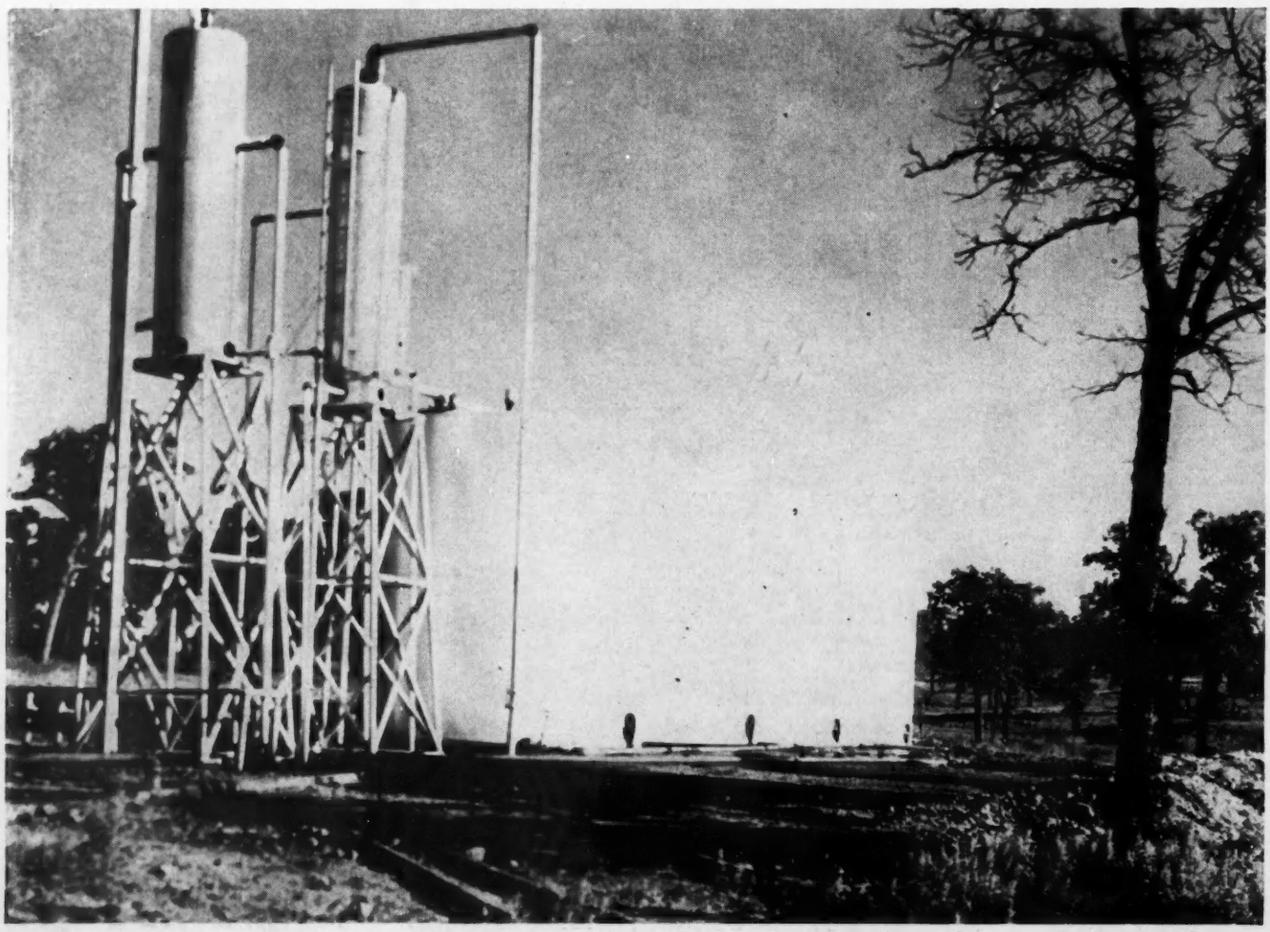
THE advantages of intelligent application of repressuring are demonstrated in the Rhodes pool, Jack County, Texas, where a $100,000 repressuring plant is sustaining itself while returning the investment at a rate greater than $1250 per month. In addition to these measurable advantages the plant will eventually bring to market an estimated 30 to 50 percent more oil.

This 57-well pool produces from sands at 2400- and 3000-foot levels. At the time of plant installation, April, 1939, all wells were pumping and water production was at an uneconomic level. Oil production was 224 barrels daily before injection; for the six months following the initial injection it averaged 421 barrels daily. About 2 million cubic feet of gas was being produced daily from the properties at the time the project was begun. The gasoline content of the gas was in excess of 1 gallon per thousand cubic feet, so the value of a related gasoline plant was apparent from the outset.

Because of the diversity of ownership in the pool the first step was formulation of a unitization plan. The Rhodes Pool Gasoline Company was formed and supported by Hanlon-Buchanon, Inc., W. H. Hammon, J. H. Herbert, Hamilton Petroleum Company, and J. G. Hammond, Inc. W. B. Hamilton was made president and directed construction of the plant.

Each sand required individual

All oil and gas is separated at one of these centralized batteries with a considerable saving on pipe and recording metering instruments.

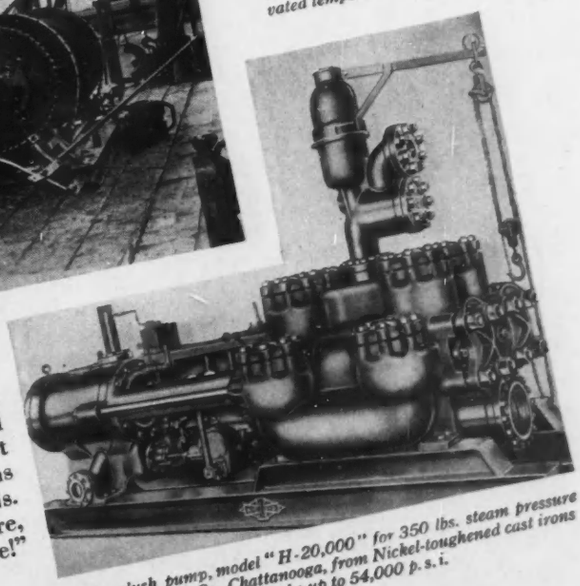


Oil field advantages FORETOLD *by physical tests*

CAST NICKEL IRONS

Reed Roller Bit Co., Houston, uses Nickel-chromium-molybdenum cast iron in its "Type 101" rotary engine. Tensile strengths show 55,000 p. s. i. Nickel inhibits growth at superheat temperatures.

Mechanical testing is important at Wichita Falls Foundry & Machine Co. Stocks are maintained of oil field equipment, particularly Diesel pistons, liners, heads and rings of Nickel cast iron. Nickel alloyed irons provide greater toughness and strength at elevated temperatures.



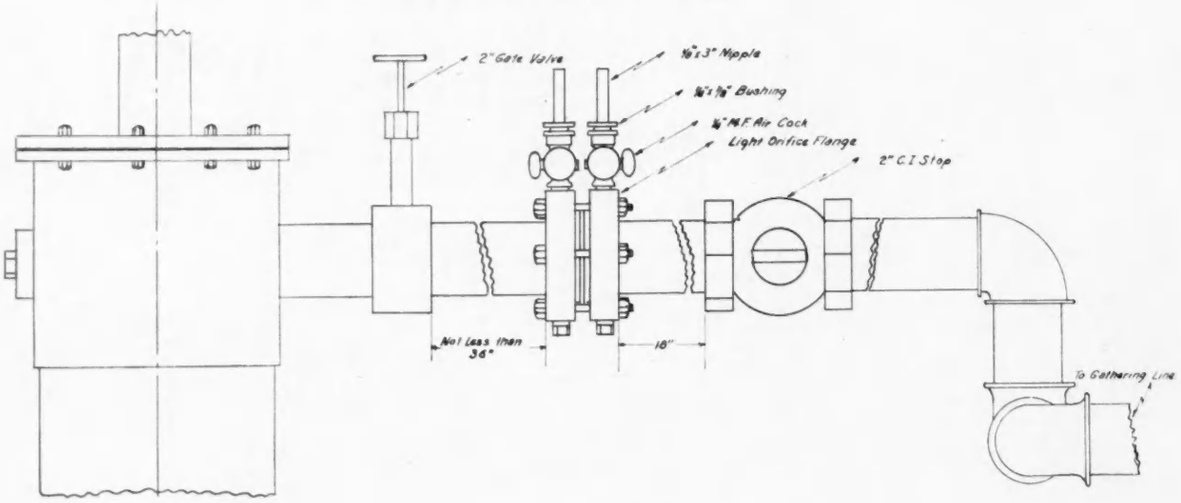
Duplex slush pump, model "H-20,000" for 350 lbs. steam pressure built by Wheland Co., Chattanooga, from Nickel-toughened cast irons with minimum tensile strengths up to 54,000 p. s. i.

Foretelling the log sheets of every drilling crew is another sheaf of reports—records of physical tests made upon all material to be used in the field. In testing labs, as on derrick floors, oil men agree that Nickel alloyed cast irons do more work at lower cost per foot and per year.

Tensile strength...hardness...wear resistance...strength at elevated temperatures...resistance to growth...dense-grained structure to maintain pressure-tightness...toughness to resist shock stress. The heightened physical properties of cast irons alloyed with Nickel are indicated by scientific testing methods. Your horny handed driller sums it all up when he says, "Sure, Nickel Iron's O. K.—never gives us no trouble!"

THE INTERNATIONAL NICKEL COMPANY, INC., 67 WALL ST., NEW YORK, N. Y.

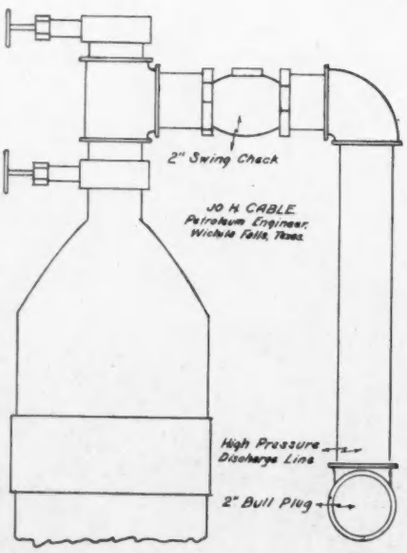
Producing Well Connections



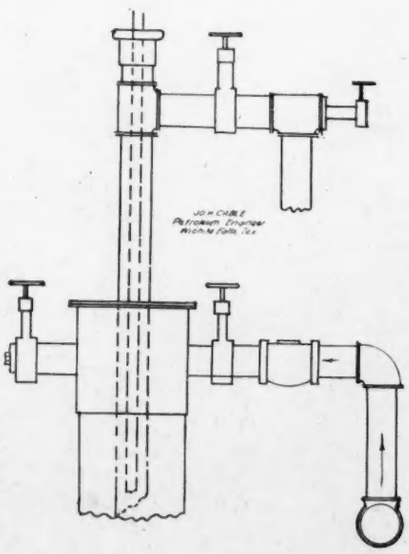
wells in the original development program and the repressuring project was designed so each sand would be repressured independently of the other. Because of differences in permeability and adjacent formations the injection pressure for the 2400-foot level was made 310 pounds, while 325-pound gas was forced into the 3000-foot zone.

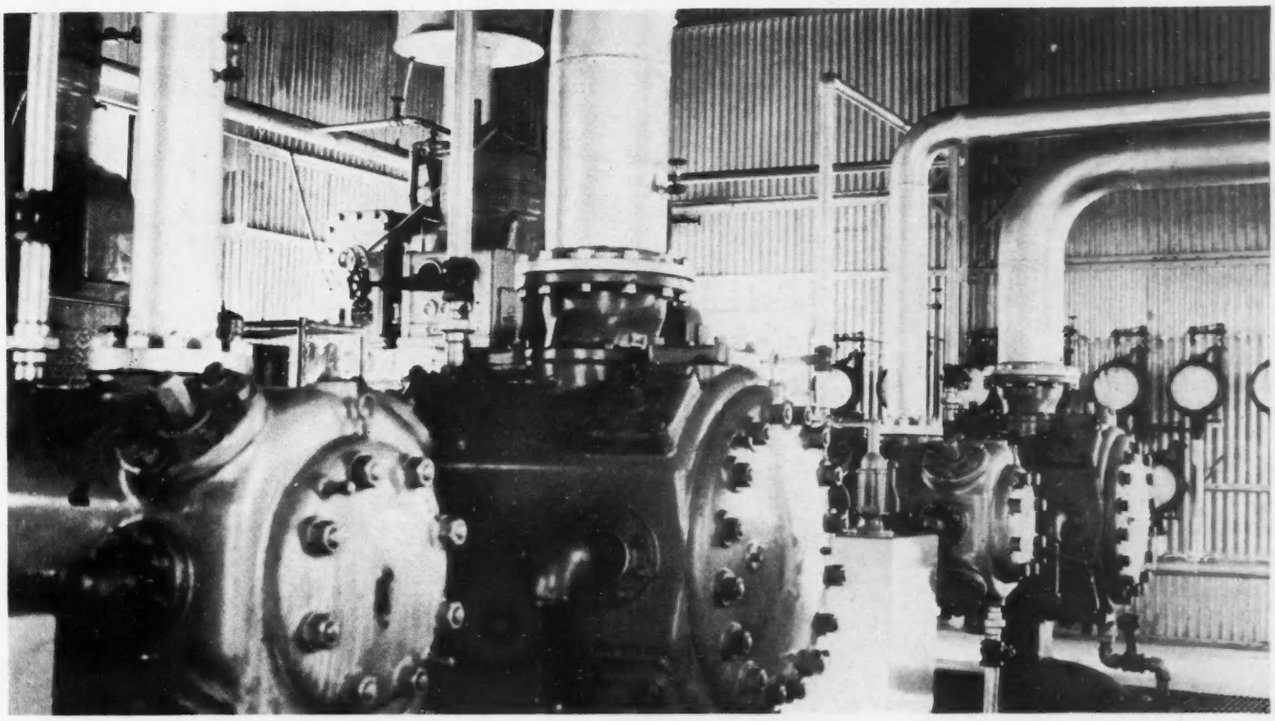
The key, or input, wells were selected from the original producers and cleaned of all sand and sediment to the bottom of the hole. Two types of control head, both illustrated, were designed. The first, for use where the gas was injected into only one sand through the annulus, featured a swedge nipple to accommodate the 2-inch fittings on the high-pressure line. Two gate valves, one for well control; the other for pressure testing, and a swing check complete the system. The second type of control, used where gas was introduced to both sands through tubing and annulus, employed a two-hole casinghead with a test gate on one side. The tubing was lowered through the casinghead packing ring to the lower sand and packed off to create a separate pressure chamber against the face of the 3000-foot formation. In

Key Well Connections



Two types of well injection connections are used, one for injecting into only one sand (at left) and the other for introducing gas into both sands (at right). In the latter, gas for the lower sand is carried through the tubing, and gas for the upper sand passes through the annular space between tubing and casing.

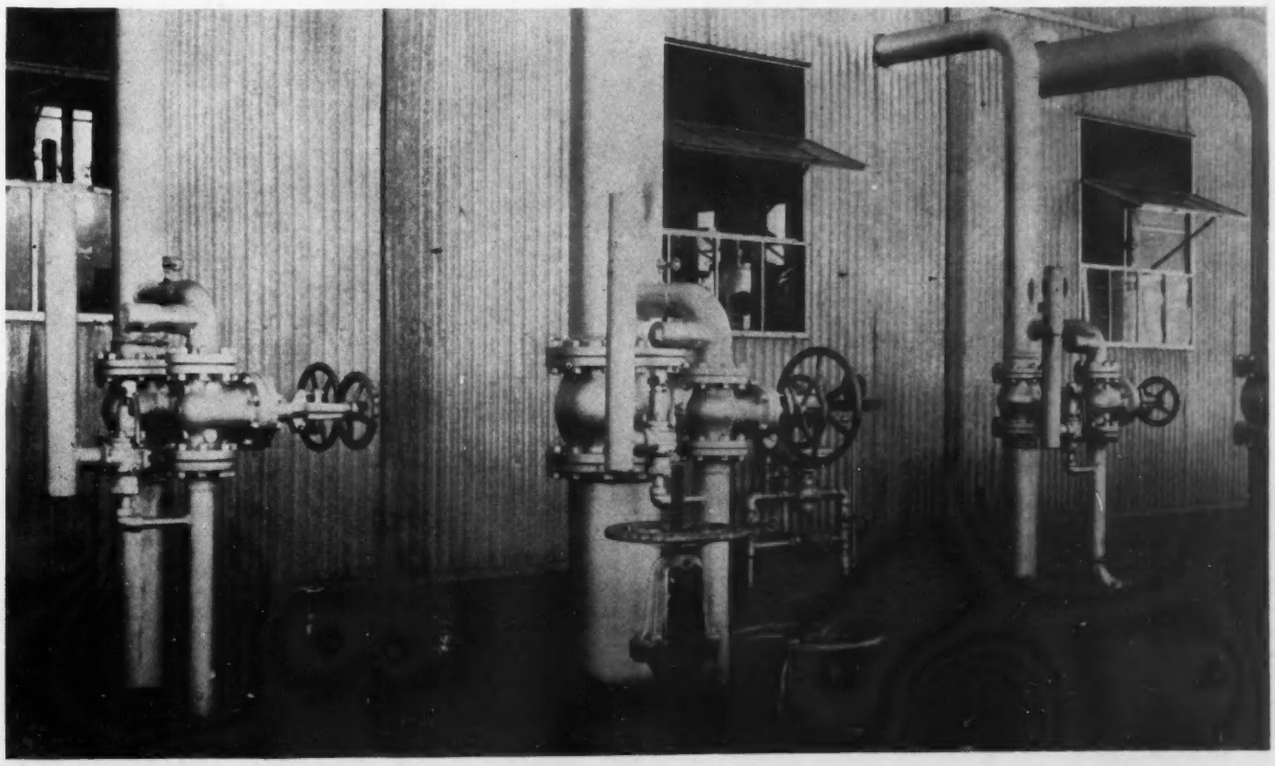




The two angle-type two-stage 250-horsepower compressors shown above comprise the repressuring plant. Refrigeration after each compression stage extracts the gasoline fractions, whose sale makes the plant a profit-making one. The intake piping arrangement is shown below.

this manner gas could be forced into the two formations simultaneously, or an intermittent injection could be made at varying pressures.

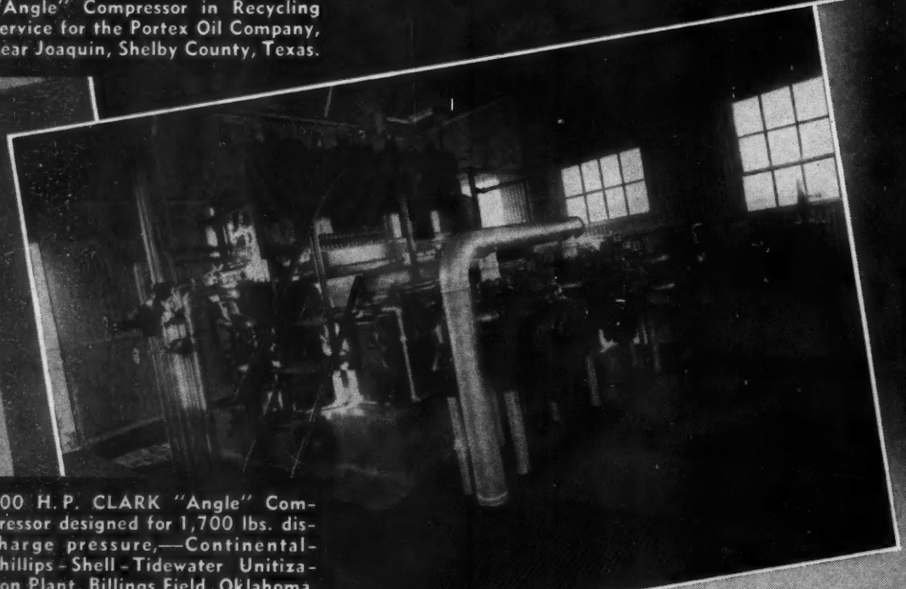
The pumping wells were all connected to centralized lease batteries equipped with separators to recover all the gas at these points, obviating the expensive network of lines necessary to connect each casinghead. Each line from battery to compressor station was equipped with an orifice meter, while each line from battery to well was equipped with a light orifice flange near the casinghead. Quarter inch air cocks and eighth inch nipples attached to the orifice test connections were installed to receive portable manometers. Casinghead gas lines were then connected



LEADERS IN GAS RECY

400 H.P. CLARK "Angle" used for gas Recycling and Refrigeration load,—gas cylinders discharge pressure 1,800 lbs.,—ammonia cylinders handling 100 tons refrigeration—Tidewater Seaboard Cayuga Plant, near Palestine, Texas.

CLARK 6-cylinder, 600 H.P. "Angle" Compressor in Recycling service for the Portex Oil Company, near Joaquin, Shelby County, Texas.



400 H.P. CLARK "Angle" Compressor designed for 1,700 lbs. discharge pressure,—Continental-Phillips - Shell - Tidewater Unitization Plant, Billings Field, Oklahoma.

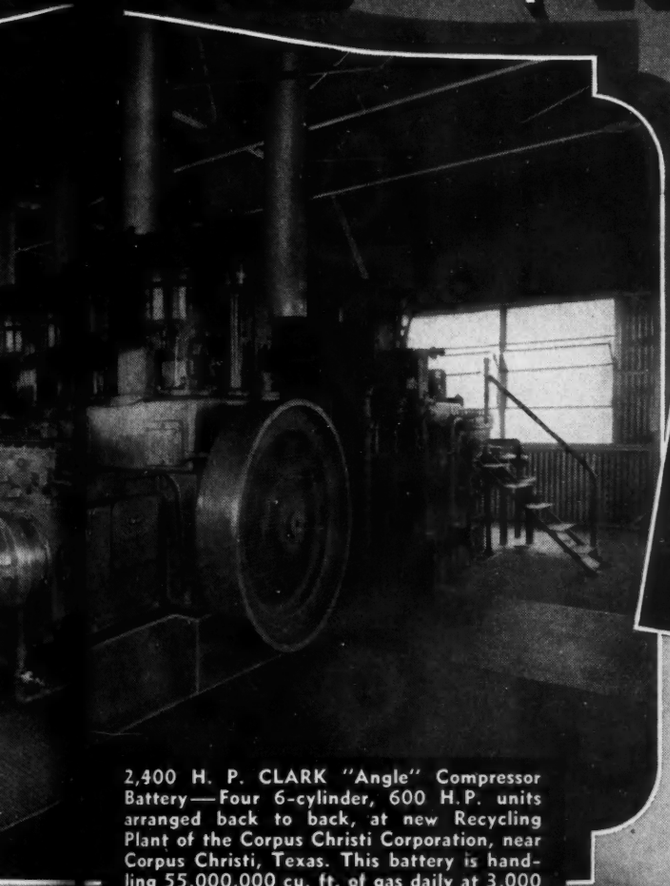
because they brin

For gas recycling and repressuri service in the Midcontinent and G Coast distillate fields, CLARK "Angl Compressors have been almost t universal choice of operators, to da Note the "Angle" installations for r cycling service shown on these page which are a few of the CLARK "Angl installations that have been made f this purpose.

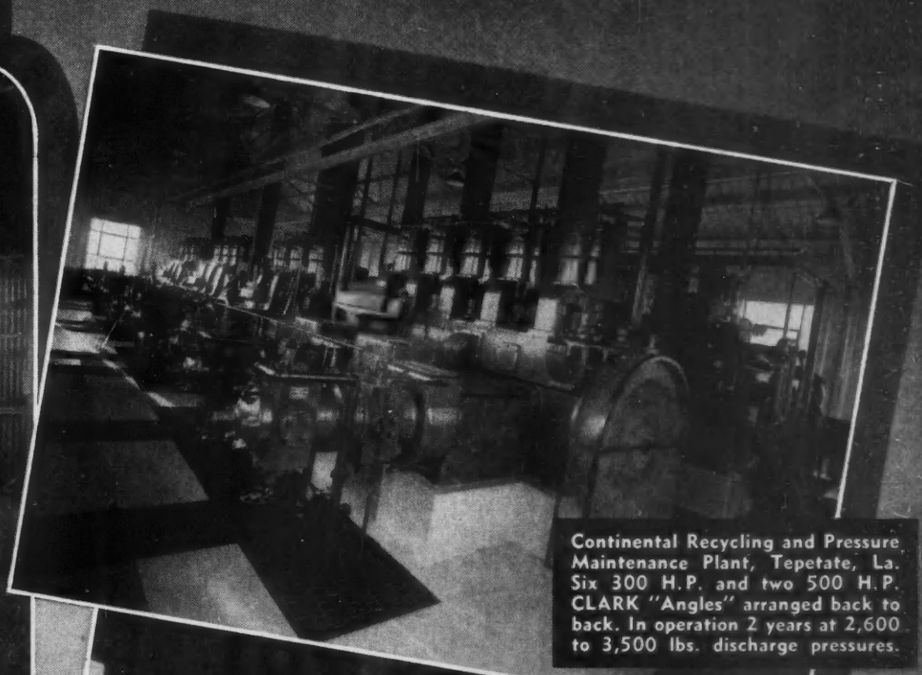
There must be reasons for this lea ership. We believe the basic explan tion to be the savings which CLAR "Angles" have introduced. These sa ings are: (1) Shipment assembled:

CL

Y.ING *and* REPRESSURING



2,400 H. P. CLARK "Angle" Compressor Battery — Four 6-cylinder, 600 H.P. units arranged back to back, at new Recycling Plant of the Corpus Christi Corporation, near Corpus Christi, Texas. This battery is handling 55,000,000 cu. ft. of gas daily at 3,000 lbs. discharge pressure.



Continental Recycling and Pressure Maintenance Plant, Tepetate, La. Six 300 H.P. and two 500 H.P. CLARK "Angles" arranged back to back. In operation 2 years at 2,600 to 3,500 lbs. discharge pressures.

CLARK 6-Cylinder, 600 H.P. "Angle" Compressor designed for 4,000 lbs. discharge pressure, in Recycling service for the Trinity Gas Corporation.

CLARK 5-Cylinder, 500 H.P. "Angle" Compressor in Recycling service for the Anco Gas Corporation, at the company's Byrd-Frost Plant, Palestine, Texas.

brin bstantial savings

ressuri maller foundations, floor space and and G uildings; (3) Lower fuel consumption, "Angl ue to CLARK patented Super-2-Cycle most th uel Injection; (4) Extreme simplicity of to da uper "2" Cycle engine design, result- s for n g in low maintenance.

e page The savings that have appealed to "Angl ther operators will appeal to you. nade b nvestigate.

his lea CLARK BROS. CO... Olean, N.Y., U.S.A.

explan rport Office: 30 Rockefeller Plaza, New York. CLAR omestic Sales Offices and Warehouses: Tulsa, ese sa kla., Houston, Texas, Chicago, Ill., Boston, Mass. bled: (31 Clarendon St.) West Coast Office: Smith- ooth-Usher Co., Los Angeles, Cal. Foreign Offices: 2 Turnmill St., London, E. C. 1; 4 Str. Gen. Poetas, Bucharest, Roumania.

LARK

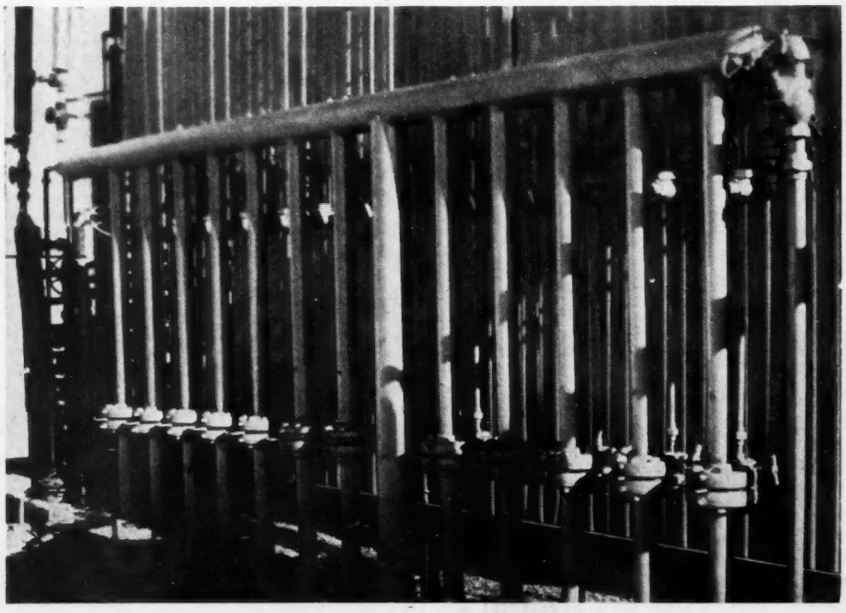
to the oil line from the tubing head so that all gas could be collected at the centralized separators.

Plant layout was made with simplicity and centralization in mind. Two 250-horsepower angle-type two-stage compressors were set. Gas engines furnished the power. The compressors draw from a common header at approximately atmospheric pressure and discharge from the second stage at 350 pounds gauge. In the process of compression the gasoline plant cools the gas after each stage and extracts the component fractions of casinghead gasoline.

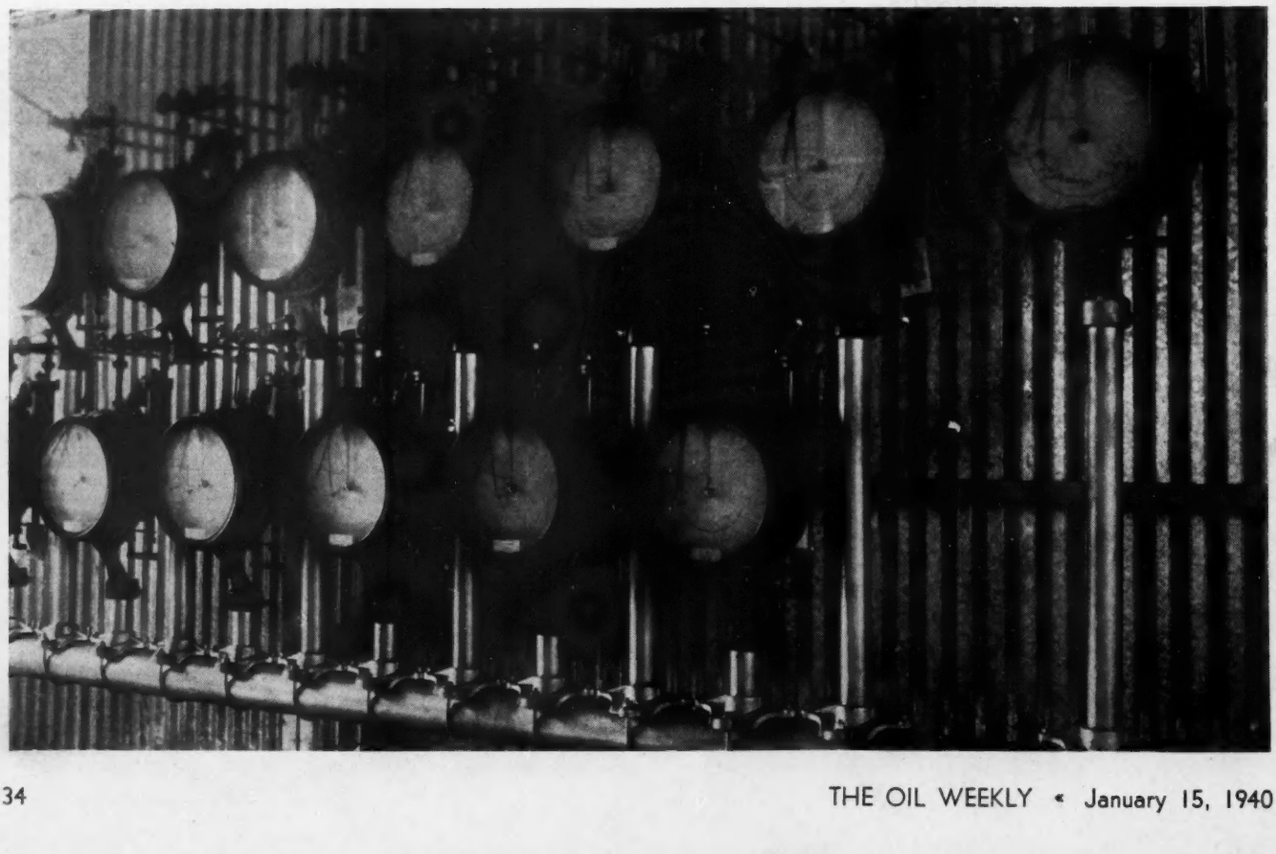
After stripping, the gas is returned through the engine room in a pipe that terminates in an outside horizontal header raised 6 feet above the ground. A steam line through the header prevents freezing.

The twelve lines from the 12 key wells are welded into the header, but without direct opening for the passage of gas. Each input line riser is equipped with a small jumper line which carries an extended-stem needle valve that can be manipulated from inside the building. On each input riser, a foot above the ground, there are orifice flanges whose taps are piped to recorders compactly rack-mounted within the building. With such an arrangement the employe controlling the input gas distribution can inspect meter charts and correct input flow to each key well without leaving the building.

Equipment used in the plant is new throughout, and all valves and fittings are rated greatly above operating pressures. The arrangement of the control equipment, the setting of the metering instruments at a central location, and the method of injection all eliminate much surveillance and maintenance labor. Cost of operation at present is $750 monthly, while the saleable gasoline fractions are marketed at $2000 monthly. The major advantage of such installations, the greatly increased ultimate recovery of oil, cannot be accurately defined but all indications in the Rhodes pool point ot a 30 to 50 percent advantage over primary recovery methods.

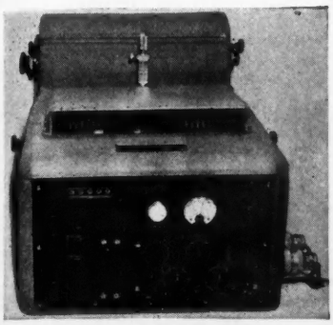


Discharge header arrangement, consisting of individual lines for each of the 12 injection wells (at left). Risers are equipped with orifice flanges whose taps are connected to recorders within the plant (below). Valve handles near the recorders permit one-man inspection and control of input gas with a minimum of time and effort.



6 REASONS WHY Electrolog

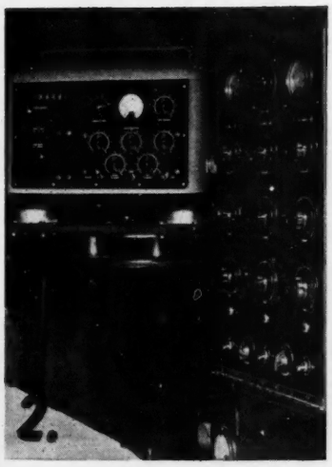
IS FASTEST • MOST ACCURATE • MOST ECONOMICAL



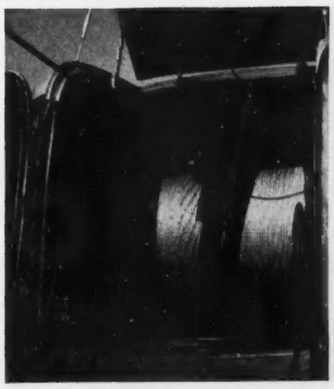
Electrolog Camera Recorder offers the choice of two standard scales, 100' or 50' to the inch and a detail section scale of 20' to the inch. Film is automatically synchronized with electrode movement.

Recording of electrode depths is automatic. The same accurate measuring device as perfected for Lane-Wells Gun Perforator double-checks electrode levels.

An initial print of the accurate Electrolog Multicurve is available immediately after the run is completed. Electrolog Multicurves allow easy comparison with other curves.



From the Control Panel all circuits are finally adjusted before a run is made to eliminate the "human element" and any chance of error from this cause.



Simple, yet extremely sensitive mechanical controls of the efficient hoisting equipment allow faster recording speeds with safety. All curves are recorded to the bottom foot of hole.

A five-conductor, steel shrouded cable supports the electrode in the hole. Four curves are recorded on a single round-trip to cut "well time" to a minimum.

In the Gulf Coast, Mid-Continent and Pacific Coast—wherever Lane-Wells Electrolog Units are located, Oil Well Operators have found Electrolog to be the most satisfactory method of electrical open hole logging.

Electrolog's accurate measurements and greater detail are made possible by the completely modern equipment shown on this page. Check each feature for yourself, and see why an increasing number of Operators demand Lane-Wells Electrolog.

LANE WELLS COMPANY

Electrolog

Why ENGINEERS PREFER IT . . .

McCAMEY FIELD, WEST TEXAS—"Super-smooth in operation" describes this well-balanced four-way pumping assembly in a West Texas Field. Another type of installation which achieves its utmost efficiency when powered by Purchased Electric Power!

TOP FLIGHT EFFICIENCY at the lowest FINAL cost . . . that is what engineers demand of power, whether it be used for pumping, pipeline or refining purposes.

There is an increasing preference for and acceptance of Purchased Electric Power among engineers throughout the country, because of its many modern advantages. Performance records, not mere theory, proves that Purchased Electric Power cuts the bill thru lower initial, maintenance and operating costs; less depreciation; less downtime; smoother, more efficient and dependable service. With Purchased Electric Power, your power company assumes more of the power investment. This means low fixed charges, insurance, etc., and a bigger working capital for you.

Why not consult sales engineers of your electric power service company, soon! That's the best and quickest way to get the *real* facts of how Purchased Electric Power provides utmost efficiency at a lower FINAL cost!

PROFIT! BY USING Purchased ELECTRIC POWER

PETROLEUM ELECTRIC POWER ASSOCIATION

HIGHLIGHTS IN THE WEEK'S NEWS

Allowables

Seek ruling on Texas marginal well law

The Texas Railroad Commission has asked Attorney General Gerald C. Mann for an opinion on the marginal well law which may determine whether the state will have proration on a 7-day basis beginning February 1.

Commissioner Jerry Sadler said last week that if the ruling will permit the commission to reduce per-well allowables below the statutory limitations fixed by the marginal well law, it will be practical to allow wells to produce seven days a week, and he will recommend that this be done. The commission so far has been governed by opinions furnished in 1933 when James V. Allred was attorney general, holding that the allowable for wells could not be cut below the statutory limits, and the statute has never been tested in the courts.

Sadler said that the new order would be ready for consideration at the statewide hearing on January 18, and that operators would be given a chance to discuss it then. He said it would include a new formula for East Texas, but declined to discuss the probable formula that would be offered. Presumably, this formula will be designed to give more oil to operators with wells along the west edge of the field, who claim that they are now losing their oil to producers to the east.

Hearing January 18

Sadler said he thought the commission should abandon the use of potential in fixing well allowables, using formulas combining per-well and acreage allowances. He favors this change because of the discrimination which has resulted. Potential tests are made on several bases.

"It's been a racket," Sadler charged, "you can take certain operators and follow them through all fields and tell where they are producing by their well potentials."

He also said he favored fixing the total state allowable at the figure estimated by the Bureau of Mines on the first of each month, then leaving allowables unchanged until the next statewide order is issued. In the past the commission has fixed allowables under the bureau estimate, and last year operators failed to produce 32,000,000 barrels of the demand which the bureau estimated for Texas crude.

This program would also eliminate "special allowables" which have been granted during the interval between statewide orders. Operators could present their cases at hearings, but no action would be taken until a new order was issued.

Because less than a week will elapse before the statewide hearing, it is possible that the opinion from the attorney General will not be ready. In that event it is probable that the commission will continue proration orders in about the same manner they have during the past year, closing down the fields for 10 days or more to prevent excessive production.

Humble's East Texas suit set February 12

Railroad Commissioner Jerry Sadler has been advised that hearing on the Humble case attacking the East Texas proration order is set before a three-judge federal court to be convened at Austin on February 12. Judges McMillan, Allred and Holmes will be on the bench, the commissioner said.

The suit attacks the order now in effect in East Texas and a hearing on a temporary injunction was held at Houston last fall. The court declined to issue the injunction without hearing the case on its merits, which led the commission to believe that this order may be held valid.

The Humble contends that the order does not give the company an opportunity to produce its share of the oil in place under its leases in the East Texas field.

News Index

General:

Allowables	37
Control	38
Courts	39
Trade Treaty	39
Men in News	43
Markets-Statistics	44
World Developments	48

U. S. Field Operations:

Arkansas	59
California	60
Completions	61
East Texas	55
Florida	52
Forest City Basin	52
Georgia	59
Illinois	52
Indiana	52
Kansas	53
Kentucky	52
Louisiana Coast	57
Michigan	59
Mississippi	59
New Mexico	59
North Louisiana	58
North Texas	54
Oklahoma	53
Rocky Mountain	60
Southwest Texas	56
Texas Gulf Coast	57
West Texas	55
Wildcat Development	66

Compact meeting to study gasoline stocks

The next meeting of the Interstate Oil Compact Commission has been set for January 22, at Wichita, Kansas. Ernest O. Thompson, chairman of the commission, has announced the meeting and said that the discussion would center around the stocks of gasoline and crude on hand during the winter months.

Dr. A. C. White, of the United States Bureau of Mines, is scheduled to speak on supply and demand. This talk may become of great importance during the course of sessions on the Cole bill, as it will probably disclose the results obtained by having the states follow the trend of bureau estimates.

The Wichita meeting was originally scheduled for December 15, 1939, but was postponed because of the Cole Committee hearings in New Orleans, which began on December 12.

Several Texas allowable hearings scheduled

The Texas Railroad Commission has scheduled the following hearings, most of which involve well allowables.

January 15: Ray field, Bee County, application of James P. Nash to produce allowable of intake wells; New Anchor field, Brazoria County, application for "reasonable" allowable; East Texas, water disposal application by The Texas Company; Midway field, San Patricio County, exemption from shutdowns.

January 16: K-M-A field, Wichita County, amendment of field rules; Jennings Ranch and Escobas, on whether two constitute one field and whether method of allocation should be changed; Old Refugio, Refugio County, allowable increase for W. L. Pearson properties, Ryals lease; Clara Driscoll field, Nueces County, shutdown exemption for Wellington Oil Company's Clara Driscoll 1, 2, 3, 4, 5, 6, 7 and 9; Clay County, allowable increase for Frabor Hodges Corporation's Kinder 1, Clark and Plumb Survey.

January 17: Emperor field, Winkler County, field rules; Halley field, Winkler County, field rules; Emma field, Andrews County, field rules; South Houston field, Harris County, method of allocation; Sour Lake field, Hardin County, shutdown exemption for lease of Julia Oil Company and Carpenter Production Company.

January 20: Barbers Hill, Chambers County, allowable increase for Mills Bennett Wilburn B-9 and B-10.

January 22: Aransas Pass field, San Patricio County, operating rules with 20-acre spacing for wells drilled to the 7100 foot sand; South Thompson field, Fort Bend County, operating rules.

MICHAEL HOLITZKE, JR., driller on General Crude Oil Company's Davis 9, in the Esperson field of Liberty County, Texas, was in Liberty hospital recovering from burns suffered last week when the well blew out and caught fire.

Control

Cole bill hearings to be February 5

General hearings on the administration's oil control bill will be opened by Congressman William P. Cole, Jr., of Maryland, chairman of the oil subcommittee of the House Interstate and Foreign Commerce Committee, on February 5, it was announced last week.

The hearings will be for the purpose of receiving the testimony of representatives of the industry and others who had no opportunity to appear during the two series of hearings already held; the first of which, last fall, was for the purpose of hearing representatives of the government agencies interested in the subject and the second, to be completed in Los Angeles this week, to give the officials of the oil states the opportunity to present their views.

As members of the oil group, accompanied by Representative Clarence F. Lea of California, chairman of the full committee, prepared to leave Washington for the West Coast January 12, Congressman Ed. V. Izac, also of California, served notice that he would oppose the measure, which he branded as a bill more likely to lead to monopoly than to achieve conservation, and asserted that he had the support of the people of his state in his position.

"The people of California hate monopoly and they are of the opinion that a monopoly composed of the major oil companies exists to the detriment of the people of the United States," he declared in a letter to Chairman Lea.

"They have just recently registered their opposition to bills of such character which, although purporting to be measures of conservation, are likely in their application to give the oil monopoly a more rigid control adverse to the best interests of the oil-consuming public and the independent element in the industry.

"The people of my district especially, by an overwhelming majority, have refused to sanction such a measure and therefore if I am to faithfully represent them, I must consider their wishes. Accordingly, I shall oppose this or any other measure which promises to deliver into the hands of the monopolists a more complete control of an industry already suffering from a partial control so detrimental to the people of the country."

Cole group to conduct hearings in Los Angeles

Members of the oil subcommittee of the house interstate and foreign commerce committee, accompanied by Representative Clarence F. Lea, of California, chairman of the full committee, will hold hearings on the administration's oil control bill in Los Angeles January 16 to 18, it was announced last week by Representative William P. Cole, Jr., of Maryland, chairman of the oil group.

The membership of the committee was completed last week by the designation of Representative Pehr G. Holmes, of Massachusetts, to succeed the late Congressman Carl Mapes of Michigan as one of the two minority members.

It was expected that the full subcommittee, consisting of Representatives Cole, Edward A. Kelly, of Illinois, Herron Pearson, of Tennessee, Charles A. Wolverton, of New Jersey, and Holmes, would leave Washington January 13 for Los Angeles.

In addition to the hearings, the subcommittee expects to spend one day in the California oil fields, and plans to be back in Washington on January 22.

California committee opposes federal control

The House bill known as the Cole Bill, does not provide machinery for conservation of the nation's oil resources which are to the best interests of the California petroleum industry, the Central Committee of California Oil Producers went on record in that respect last Friday at a special meeting of the group.

In an hour's discussion, the Central Committee agreed to present factual data concerning the production situation as it now exists in California and in order to acquaint the Cole Committee with all angles here, it appointed representatives to appear before it at its meetings to be held at the Biltmore Hotel starting Tuesday, January 16. It is understood that Lawrence Vander Leck, chairman of the Central Committee, L. L. Aubert, chairman of the allocation committee, and any others needed will represent the group.

Trade Treaty

Independent association again protests Venezuelan imports

The Independent Petroleum Association again protested the oil-excise duty reduction granted in the recently consummated reciprocal trade agreement wtih Venezuela and then, in order that the industry might be advised of the situation, made public the correspondence with the State Department.

The communications included the letter written to President Roosevelt by Russell B. Brown on November 9, asking that the oil situation be thoroughly reviewed before the pact was made effective, the reply, dated November 29, of Harry C. Hawkins, chief of the State Department division of trade agreements, and the reply to that letter, dated January 6.

Comparison of the November 29 letter of Hawkins with a letter written by Secretary Cordell Hull to Governor Payne Ratner of Kansas, at about the same time, shows the two to be almost identical in verbiage in the defense of the department's position. (The Hull letter was carried on page 48 of the December 4 issue.)

In his January 6 letter, Brown declared that the benefit of the tax cut would not go to Venezula but to the American companies exploiting its oil and that therefore there was no reciprocity involved between that country and the United States.

The department, he said, has apparently been "misadvised" on important points, among them that these imports will not be competitive with domestic products although they are actually directly competitive with about 24 percent of all our oil and indirectly with all of it, the very reason why the industry asked and Congress enacted the legislation imposing the tax.

"In this case," he commented, "the State Department has placed itself in the position of setting its judgment or the judgment of some unnamed 'experts' against the judgment of repeated Congresses and of the domestic petroleum industry."

Particularly vulnerable to challenge, Brown asserted, are the department's contentions that the quantity of oil which may be admitted at the reduced rate is too small to affect adversely the domesic industry to any important degree; that imports largely supplement, rather than compete with, domestic petroleum production; that export markets for oil are of great importance and that valuable concessions have been obtained in 11 of the trade agreements so far concluded, and that both industry and agriculture benefit from the expansion of our foreign trade and that the reduction of trade barriers inevitably tends toward that expansion.

"It is difficult to understand on what basis the conclusion is reached that five percent is too small a proportion to seriously affect the domestic industry," he said in reference to the first contention. "Evidently the department admits and assumes that some quantity of such imports might adversely affect the domestic industry. Otherwise, it would not maintain that five percent is too small a portion to do so. It would be interesting to know just what the department considers to be the percentage of low-cost foreign goods necessary to have a serious effect upon domestic producers."

As a matter of fact, he continued, many in the industry believe that the largest single factor contributing to the serious collapse in crude prices in October, 1938, was the uncontrolled low-cost oil produced from new pools in Illinois, whose production, on the basis of refinery output which is used for the fixing of the import quota, was but 3.6 percent, or considerably under the 5 percent which the department feels is unimportant.

Actually, he asserted, since natural barriers and foreign competition exclude California from competition in states east of the Rocky Mountains, the 5 percent limitation on imports becomes 6 percent of the domestic output from the other areas. Should the industry experience a period of demoralization and decreased demand, further, the imports would be at a much higher proportion of then current demand because they are based on refinery activities of the preceding year.

So far as the competitive angle is concerned, Brown argued, Venezuelan fuel oil will compete with the domestic product, one of the most important products of the American industry.

As to the advantages gained for the American industry in 11 trade agreements, he asserted, less than 4 percent of our oil exports, which amounted to

approximately $388,600,000 in 1938, are affected by the reduction in duties or increases in quotas granted by foreign nations.

"This 4 percent advantage is not compared to the substantial reductions of import taxes which, under the favored-nation provision, apply to practically 100 percent of our petroleum imports," he said, and the great gains in takings of American oil by agreement countries are to be attributed to increased need for national defense and unsettled conditions abroad rather than to the concessions which were secured.

Referring to the department's contention that enactment of the trade agreements act was based on the depressed conditions of industry and agriculture, Brown pointed out that the oil industry is one of the largest contributors to the receipts of the farmers, paying $200,000,000 a year in leases and bonuses, while it spends $800,000,000 yearly for the products and services of other industries and gives employment directly to approximately 1,000,000 persons and indirectly to perhaps 4,000,000 others.

"If 'the depressed condition of industry' is to be remedied," he told the department, "encouragement of this domestic industry would seem to be a better method than placing it at the mercy of those who domniate the oil markets of the world. It is recognized that the companies operating in Venezuela dominate the world petroleum markets outside of the United States. By giving this concession to these companies this trade agreement is inviting them to include the markets of the United States in the scope of their world monopoly.

"We especially regret that the State Department in such utterances as we have seen, has nowheres recognized that the direct benefits of this reduction in the petroleum excise taxes goes to a few American important companies and not to the people or the government of Venezuela."

Miscellaneous

Offshore controversy coming to a head

Controversy over the Navy Department's efforts to secure possession of the California offshore oil fields for a naval petroleum reserve has been revived in Congress, indicating that the issue may be fought out to a finish during the current session.

Opposition to the appropriation for the Department of Justice of funds which he charged are being used to cover the expense of the government's attempt to secure title to the lands was threatened January 12 by Representative Albert E. Carter (Rep., Cal.), a member of the House Appropriations Committee which handles the supply bills for all the federal agencies.

Carter said he would demand that Alexander Holtzoff, special assistant to the attorney general in charge of the matter, be called before the subcommittee in charge of the Department of Justice appropriations bill, to explain just what the department is doing. Holtzoff is directing research work which, it was explained by department officials, is intended to "clarify" the situation with respect to the ownership of title to the offshore fields.

Murphy's nomination may affect trust trial plans

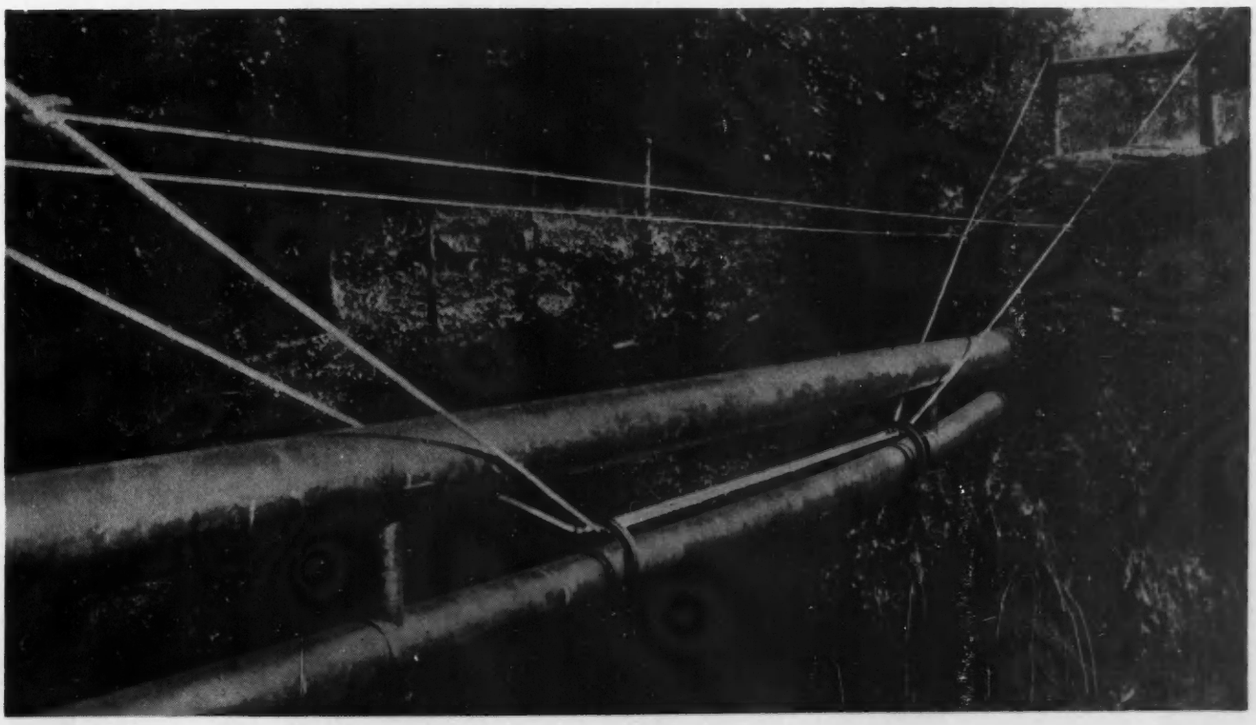
Possibilities that plans of the Department of Justice to secure a reconsideration of the Supreme Court's four-to-four decision in the Madison case after the membership of the Supreme Court has been completed may be thwarted by the non-participation of the court's ninth member, now Attorney General Frank Murphy, were raised January 11 at a hearing on Mr. Murphy's nomi-

[*Continued on page 46*]

Secondary Line Forms Creek Crossing Support

IN crossing deep ravines, gulches and eroded creek beds when laying a natural gas line near Cement, Oklahoma, the Oklahoma Natural Gas Company employed a bridge construction method that eliminated stresses on the pipe line that accompany ordinary procedures.

Instead of using the common method of supporting a pipe line across a narrow canyon from above, the company laid a secondary section of pipe across the ravine directly beneath the main line, as shown in the accompanying photograph. The secondary pipe line was used to support the weight of the line carrying gas, thus removing the stresses of lifting or supporting the main system. The main line is supported on the secondary line by means of saddles. Support for the secondary line was obtained by threading wire lines through flanges or rings.



NOW, SAFETY NEED NOT BE SACRIFICED FOR ECONOMY!

"CAM

YOUR COMPLETIONS . . . O

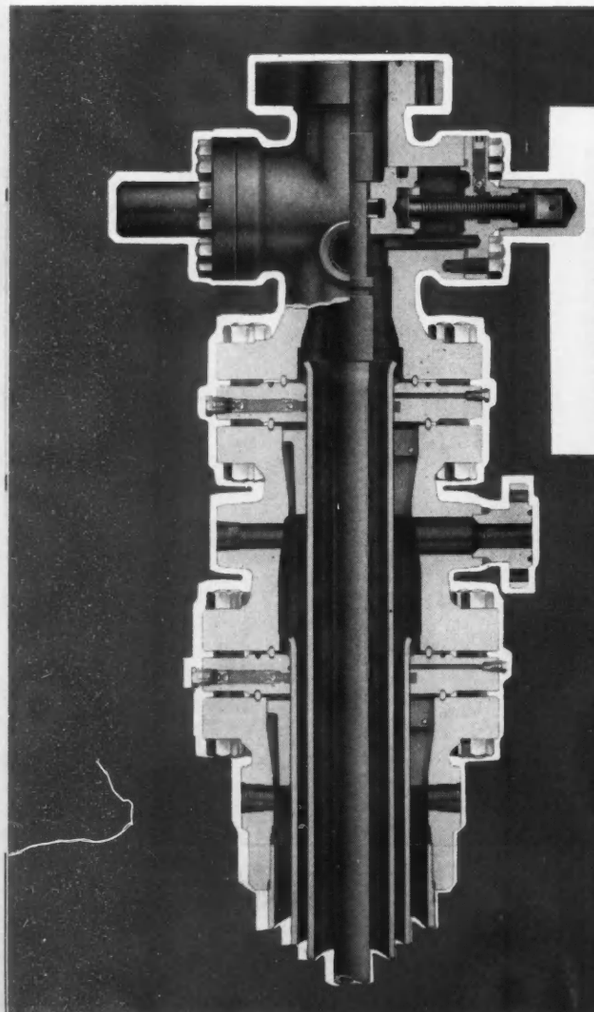
Ask any operator anywhere what he thinks about Cameron Drilling Control equipment and, chances are, he'll tell you it's the finest protection a man can buy for his well and his men. For almost twenty years, the name "CAMERON" on Blowout Preventers and Gate Valves has been the symbol of utmost safety and dependability.

Now, utilizing many of the mechanical features of the famous **Cameron Drilling Control Units,** Cameron offers a complete line of **Casing and Tubing Head Nests** which provide the *same degree of positive protection during every step of the completion operation.*

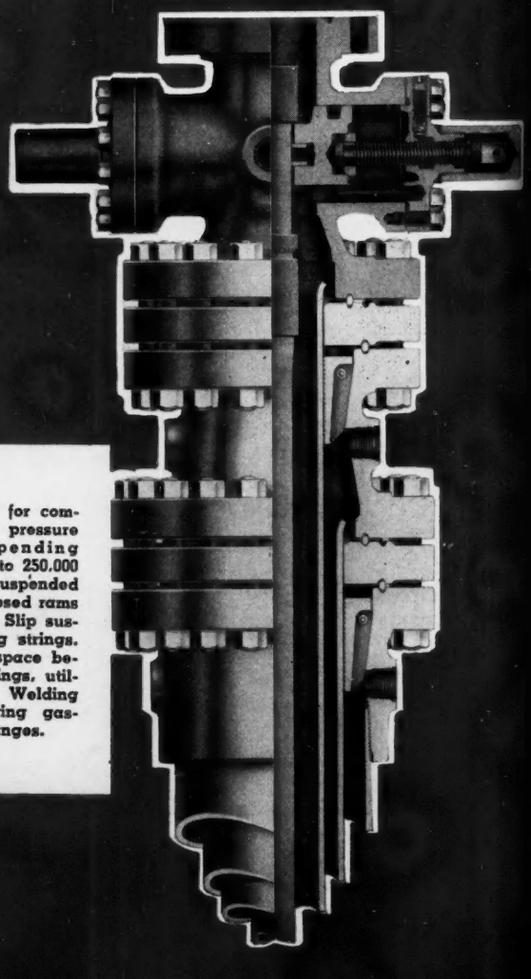
The new, low-cost Type "LD" Ram Type Tubing Control Head serves a four-fold purpose: (1) It provides the ultimate in safe, dependable control during every step of the completion operation; (2) It provides three proven methods of suspending and sealing the tubing string; (3) It obviates the need of a cement retainer when making a squeeze job; (4) It is extremely practical on a re-working subsequent to original completion of the we This unique Tubing Control Head is shown in cro section below. Note how its rams, equipped with Se Feeding Packing Elements, may be utilized for both su pending and sealing the tubing string. Note, also, t plastic packing seal provided around each ram thru screw, which may be safely repacked under pressur

Cameron Types "U" and "UP" Boll-Weevil Tubi Heads, which present an improved sealing means ov the conventional boll-weevil hanger, are available f operators who prefer that method of tubing suspensio The cross-section drawing on the extreme right, belo illustrates these two types.

Cameron Casing Heads and Spools employ nume ous exclusive features of design. With the Type "M Welding Flange, they provide a pre-tested welded se



CAMERONEST for completing extremely high pressure wells and suspending casing loads of any magnitude. Tubing suspended and sealed on closed rams of Control Head. Slip suspension of casing strings. Welded seal of space between casing strings, utilizing Type "M" Welding Flange with unique test-weld feature. A.P.I. ring gaskets between flanges.



CAMERONEST for completing medium pressure wells and suspending casing loads up to 250,000 lbs. Tubing suspended and sealed on closed rams of Control Head. Slip suspension of casing strings. Welded seal of space between casing strings, utilizing Type "J" Welding Flange. A.P.I. ring gaskets between flanges.

...ERON-IZE"

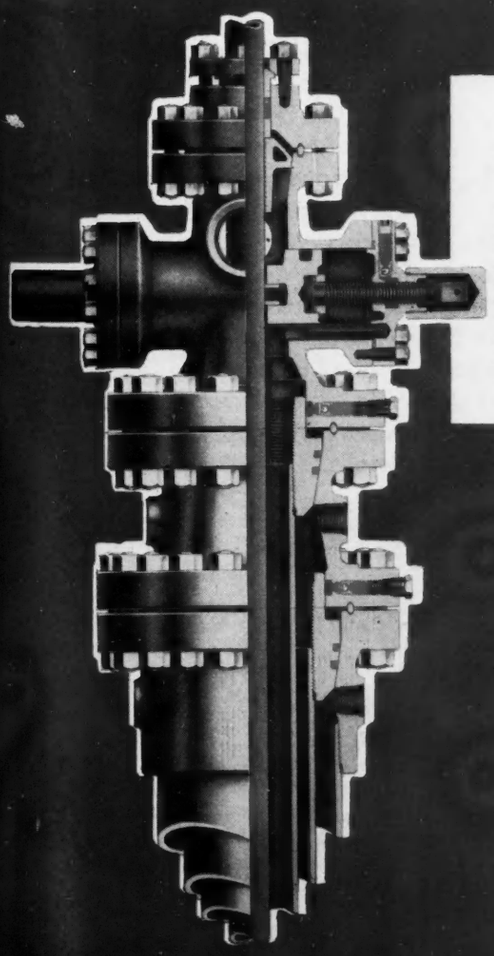
...OMPARABLE COST, BUT WITH INCOMPARABLE SAFETY

of the space between casing strings. This unique test-weld feature also provides a highly efficient secondary seal, which may be safely repacked under pressure at any time. Both casing head housings and spools readily accommodate either slip or boll-weevil hangers. Further, the 6,000 lb. test housings and spools offer two types of slip suspension; a long, heavy-duty type for suspending casing loads of any magnitude, and a regular type for loads up to 250,000 lbs. The Casing Head housing may be furnished with landing base, if desired. For additional safety, all casing size threaded connections above the surface pipe have been eliminated. Both Casing Heads and Spools will pass freely any tools which will enter the casing string below them.

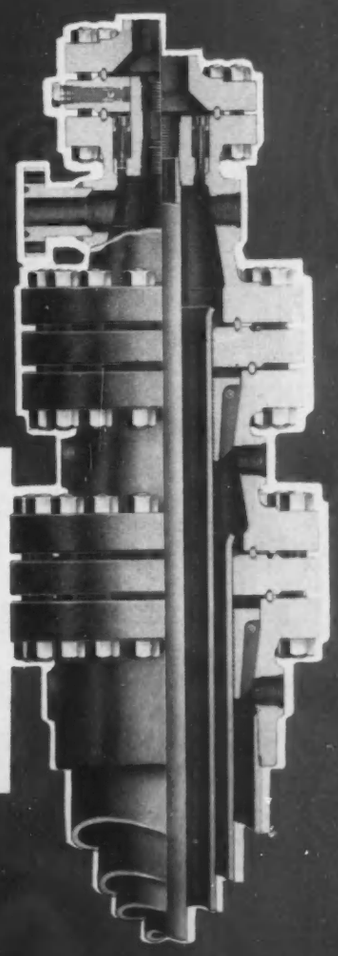
Full particulars on all types of Cameron Tubing Heads, Casing Heads and Spools, as well as the Cameron Closed Pressure Method of Drilling and Completion, will gladly be provided on request.

CAMERON IRON WORKS, INC. 711 MILBY ST., HOUSTON, TEXAS

EXPORT—74 Trinity Place, New York, N. Y.
CALIFORNIA DISTRIBUTOR—The Howard Supply Co., Los Angeles.
OKLAHOMA REPRESENTATIVE—Paul Edkin, Tulsa.



CAMERONEST with slip suspension of tubing to facilitate setting formation packer, and boll-weevil suspension of casing strings. Rams of the Control Head are utilized as an annular space master gate, with outlets provided above rams. Repackable plastic packing seal provided around shank of boll-weevil hangers.

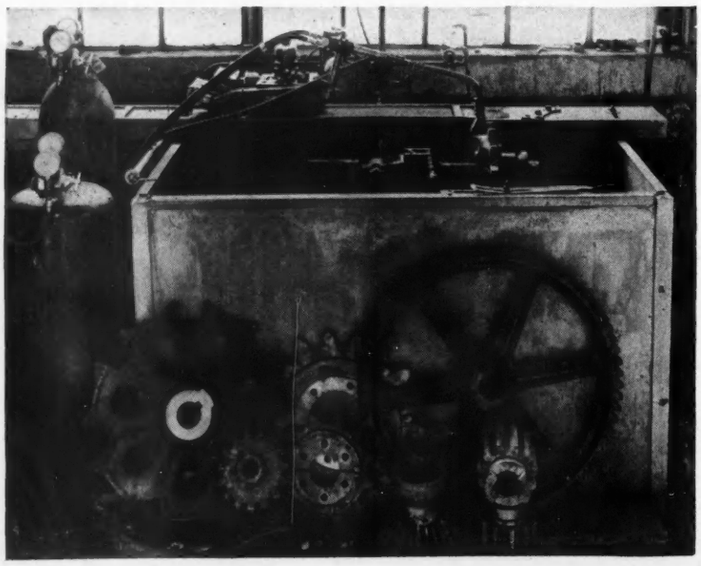


CAMERONEST with either Type "U" or "UP" Boll-Weevil Tubing Head and slip suspension of casing loads up to 250,000 lbs. Welded seal of space between casing strings, utilizing Type "J" Welding Flange. Cross-section drawing illustrates both types of Tubing Heads: Right—Type "U" effects seal by making up on recessed socket heat set screws to compress neoprene packing; Left—Type "UP" is identical to the Type "U," but is also provided with the unique repackable plastic packing seal above the primary seal.

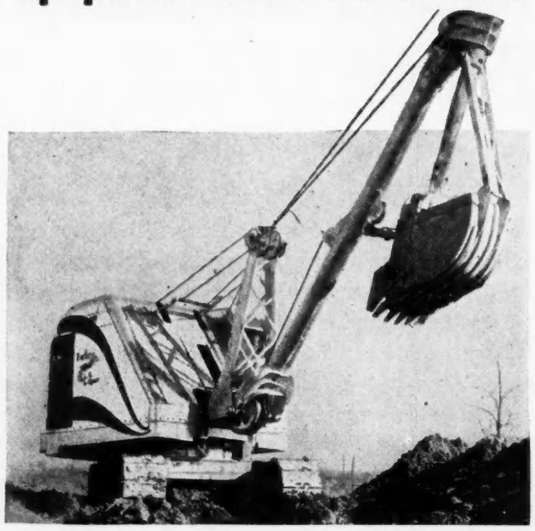
AIRCO FLAME-HARDENING

. . . makes wearing parts last longer—equipment more serviceable

Close-up of gear tooth being flame-hardened, showing water quench.



A group of flame-hardened parts used in Buckeye equipment.



Vital wearing parts—spur gear teeth, bevel pinions, sprockets, dipper teeth—last many times their normal life span when Airco Flame-Hardened. That's why the Buckeye Traction Ditcher Company, Findlay, Ohio, utilizes this quick, inexpensive Airco process to safeguard wearing parts on their construction equipment—and assure maximum, trouble-free service for the buyer. This process has enabled Buckeye to maintain a stock of hardened parts which can be machined to proper hub bore when needed. » » » This economical Airco method of case hardening steel surfaces is accomplished without materially affecting the physical properties of the core. More ductile metal, highly resistant to shock and strain, without danger of warpage, is assured when parts are Airco Flame-Hardened. » » » The facilities of Airco's Applied Engineering Department are available to help Airco customers solve problems involving surface wear. Write for full details.

AIR REDUCTION SALES COMPANY IN TEXAS

General Offices: 60 East 42nd St., New York, N. Y.

MAGNOLIA-AIRCO GAS PRODUCTS CO. HOUSTON . BEAUMONT . WICHITA FALLS . FORT WORTH . DALLAS EL PASO . SAN ANTONIO

CRUTCHER-ROLFS-CUMMINGS
HOUSTON

AIRCO DISTRICT OFFICES IN PRINCIPAL CITIES. Represented in Canada by RAILWAY & ENGINEERING SPECIALTIES, LTD., and CANADIAN LIQUID AIR COMPANY, LTD., Toronto, Montreal, Winnipeg

AIRCO *Anything and Everything for* GAS WELDING or CUTTING and ARC WELDING WILSON

MEN IN THE INDUSTRY'S NEWS

JOHN A. BROWN, president of Socony-Vacuum Oil Company, has been named chairman of the Greater New York Fund's 1940 campaign.

NEWTON BURNETT, scout for Sun Oil Company in North Texas, has transferred headquarters from Greenville to Gainesville.

RALPH S. POWELL, Fort Worth division geologist for The Texas Company, was elected president of the Fort Worth Geological Society, and Louis H. Freedman, Snowden & McSweeney Company, was chosen vice president. Vernon Lipscomb, The Pure Oil Company, was re-elected secretary-treasurer.

GRADY H. VAUGHN, Dallas drilling contractor and producer, and J. C. Karcher, president of Coronado Exploration Corporation, have been elected directors of the Dallas National Bank and Republic National Bank of Dallas, respectively.

R. C. WARD, of Superior Oil Company, presented a paper before the Houston Geological Society January 11 on "The Geology of the Illinois Basin."

T. G. PRICE, scout for Carter Oil Company, Ardmore, Oklahoma, is in Jackson, Mississippi, on special assignment. J. O. Campbell, Jr., petroleum engineer, has been transferred to the Osage district in Southern Oklahoma.

ROBERT S. COOKE, engineer, Carter Oil Company, has been transferred from Seminole to the Tulsa office.

JOSEPH JENSEN, petroleum engineer for Tide Water Associated Oil Company, and for five years a director of the Los Angeles Chamber of Commerce has succeeded E. O. Slater as chairman of the chamber's new committee on natural resources. Jensen is a graduate of the University of Utah in mining engineering and gained a master's degree in geology at Columbia University. He was for a time assistant professor of mining at Carnegie Institute of Technology.

CLARK BAKER, Transwestern Oil Company's scout in Southwest Texas, has been transferred to Mississippi.

J. C. McINTOSH, production superintendent for Reed and Cox in the Southwest Texas division, has just returned from a trip to Canada.

NATHAN PITCARIN, Southern Minerals Corporation scout in Corpus Christi, is back to the office after a holiday vacation at his home in Philadelphia.

DON ROSS, landman for Barnsdall Oil Company at Evansville, Indiana, was in Corpus Christi last week.

LEE WEBSTER, formerly assistant to Bowman Thomas, has replaced Thomas as division petroleum engineer for Humble Oil & Refining Company in Corpus Christi. Thomas recently was transferred to Houston to take position as chief petroleum engineer of the company.

H. W. HARTS, general superintendent of Warren Petroleum Corporation, Tulsa, has been named chairman of the convention program committee for the annual meeting of the Natural Gasoline Association of America, to be held May 15 to 17 at the Hotel Tulsa, Tulsa.

Announcement of the committee appointments was made last week by George P. Bunn, Phillips Petroleum Company, association president. Other committee members are W. F. Fulton, United Gas Pipe Line Company, Houston; J. R. Jarvis, Lone Star Gasoline Company, Dallas, Texas; G. W. McCullough, Phillips Petroleum Company, Bartlesville, Oklahoma; C. R. Williams, Continental Oil Company, Ponca City, Oklahoma; D. M. Wolfe, Standard Oil Company of California, San Francisco, and R. A. Worley, Parade Gasoline Company, Inc., Shreveport, Louisiana.

JOHN D. TODD and Frank C. Roper, consulting geologists, Houston, have opened offices at 610 Tower Building, Jackson, Mississippi.

BOB LYNE, deputy supervisor for the Texas Railroad Commission at Corpus Christi, is back at work after being away five weeks due to illness.

R. C. WARD, Superior Oil Company, discussed "The Geology of the Illinois Basin" before the Houston Geological Society last week.

T. G. "CHOC" PRICE, scout for Carter Oil Company in southern Oklahoma, has been transferred to Jackson, Mississippi, as senior scout on special assignment.

LIEF H. OLSON, partner in Olson Drilling Company, is preparing to leave Ada, Oklahoma, for Fort Worth, Texas, where he will open a new office for the company.

Announce evening series of law lectures

A series of special evening lectures on oil and gas law were announced last week by the South Texas School of Law, Houston. Classes open January 18 and will meet every Thursday for 16 weeks in the Y.M.C.A. building.

Lectures will include Rex G. Baker, Judge H. E. Bell and J. Q. Weatherly, all of the Humble Oil & Refining Company legal staff; A. W. Bounds, of Stanolind Oil & Gas Company; T. J. Lawhon, of The Texas Company; Charles I. Francis, of Vinson, Elkins, Weems & Francis, and James L. Shepherd, Jr., of Baker, Botts, Andrews & Wharton.

Lincoln to address metals society at Houston

Fusion Welding will be discussed by James F. Lincoln, president of Lincoln Electric Company, before the Texas Chapter of the American Society of Metals January 19. The meeting, to be held at the River Oaks Country Club, Houston, will be preceded by a dinner at 6:45 p.m.

T. E. SWIGART, vice president of Shell Oil Company, presented service emblems to 147 employees of the company who had been with the company for 10 years or more. Presentation was made during a banquet and dance held in Houston last week by the employees' Ten and Over Club.

L. J. LYNCH has been named superintendent of the Shreveport district for Ohio Oil Company. He succeeds J. S. Hasson, retired.

J. G. MONTGOMERY, vice president in charge of production and geology for the United Natural Gas Company, discussed "The Geology of Oil and Gas Deposits" before the Northwestern Society of Engineers meeting in Franklin, Pennsylvania, last week.

DAN L. CLARK, J. W. Wilson, Jr., and B. Delamater last week organized the Dan L. Clark Drilling Company as a Texas corporation with headquarters at Corpus Christi.

BOOTH KELLOUGH is a new employee in the legal department of Amerada Petroleum Corporation, Tulsa.

RODNEY FORSYTH, district geologist, Seaboard Oil Company, has been transferred to Evansville, Indiana.

IRA MONTGOMERY, Tulsa, is now with Lago Oil & Transport Company at Aruba, Dutch West Indies.

J. SAYLES LEACH, vice president of The Texas Company, was named to the directorate of the National Bank of Commerce, Houston.

ROBERT S. COOKE, engineer for Carter Oil Company at Seminole, Oklahoma, has been transferred to the Tulsa office.

DIED:

C. R. COLE, 74, president of the Cole Petroleum Company and pioneer Texas and Oklahoma operator, died January 3. His body was found near Laredo, Texas, January 5, and authorities pronounced his death suicide by gunshot. Cole opened the Cole field of Duval County, a gas area, and the West Cole field of Webb County, an oil field. Surviving are his wife, his son and partner, C. E. Cole; a daughter, Mrs. Mary Cole Harry, San Antonio, Texas, and two grandchildren.

R. I. GOLDMAN, 47, for 14 years an employe of Lago Petroleum Company, was killed while working in Venezuela on December 13. The body has been returned to Houston, Goldman's former home, for burial.

TOM ANGELL, field workman for Magnolia Petroleum Company, was asphyxiated by gas January 7 while making a pipe-line connection at one of the company's wells in the Wasson field, West Texas. Charles Rodgers, a co-worker, was overcome while trying to rescue Angell.

Gasoline loses additional ground; other oils steady

Mixed trends have continued in the industry's markets, gasoline having displayed further weakness and fuel oils having gained additional strength.

These conflicting trends directly reflect the contrasting situations regarding inventories, gasoline stocks having continued excessive, while supplies of both light and heavy fuel oils are relatively small, considering current record demand.

Crude Prices Threatened

The crude price structure has remained stable, but the persistent decline of gasoline prices, wholesale and retail, represents a distinct threat to the current crude postings.

A substantial part of the recovery that the gasoline market made in 1939 has been canceled in the current downward movement of prices, and there is danger that quotations may approach the extreme low levels to which they sank late last winter.

During the past 10 days all grades of gasoline have been marked down another ⅛-cent a gallon, in the Middle Western marketing territory and also at Mid-Continent refineries. This decrease was only one of numerous similar reductions in the past several months, and prices now are lower than in August.

It is stated that gasoline prices have declined approximately to or below the break-even level for refiners, on the basis of the present posted prices for crude; and any further reductions would put pressure on the crude market.

Other petroleum products than gasoline meanwhile have continued firm, and some have shown further price increases.

The heating oils, particularly, have been strong in the past 10 days, with cold weather prevailing, and with stocks relatively small. The prices of those oils have been marked up generally ⅛-cent a gallon in the Middle Western marketing area.

Prices of the heavier, industrial fuel oils have remained generally unchanged, but those oils are in strong demand, as business activity has continued at a high level.

Lubricants also have retained all their former strength, although prices have not increased further. Supplies continue scarce, and refiners have very little available for buyers other than their regular customers.

PRODUCT PRICES

	Range Last Week (Cents a gal.)		Changes from Week Before	
REFINED GASOLINE				
Oklahoma Refineries:				
62 Octane and Under	3⅞	4⅝	—⅛	...
63-66 Octane	4⅛	4⅜	—⅛	—⅛
67-69 Octane	4⅜	5⅛	—⅛	...
70-72 Octane	4⅝	5⅜	—⅛	...
Mid-Western Tank Car:				
62 Octane and Under	3⅞	4⅝	—⅛	...
63-66 Octane	4⅛	4¼	—⅛	—⅛
67-69 Octane	4⅜	5⅛	—⅛	...
70-72 Octane	4⅝	5⅜	—⅛	...
NATURAL GASOLINE				
Grade 26-70:				
F. O. B. Group 3	2½	...	...	...
F. O. B. Breckenridge, Texas	2¼	...	...	...
KEROSENE				
Oklahoma Refineries:				
41-43 water white	3⅝	4¼	...	...
42-44 water white	3¾	4⅝	...	...
Mid-Western Tank Car:				
41-43 water white	3⅝	4¼	...	...
42-44 water white	3¾	4⅝	...	...
FUEL OILS				
Mid-Western Tank Car:				
Range Oil	3½	3¾	...	—⅛
Gas and Fuel Oils:				
No. 1 Prime White	3½	3⅝	...	...
No. 1 Straw	3¼	3⅜	...	...
No. 2 Straw	3¼	3⅜	+⅛	+⅛
No. 3 Straw	3⅛	3¼	+⅛	+⅛
No. 5 (per bbl.)	65	70	...	...
No. 6 (per bbl.)	45	55	...	...

Trends of United States Production and Stocks

Figures are from American Petroleum Institute weekly reports, except those on crude stocks, which are from Bureau of Mines weekly reports

	Crude Oil Production (Barrels Daily)	Crude Runs to Stills (Barrels Daily)	Crude Oil Stocks (Barrels)	Gasoline Stocks (Barrels)	FUEL OIL STOCKS	
					Gas Oil & Dist. Fuels	Residual Fuel Oil
1937:						
August 28	[5]3,731,450	3,425,000	309,506,000	66,997,000	112,111,000	
September 25	3,666,300	[5]3,455,000	307,974,000	65,620,000	116,472,000	
1938:						
March 19	3,433,550	3,080,000	306,380,000	[3]93,192,000	122,067,000	
November 12	3,243,250	3,180,000	273,394,000	[6]67,551,000	34,175,000	120,491,000
November 26	3,260,900	3,295,000	270,563,000	68,628,000	33,749,000	119,885,000
December 10	3,245,100	3,150,000	[6]269,509,000	68,687,000	32,068,000	118,711,000
December 31	3,201,450	3,115,000	273,024,000	71,695,000	29,082,000	115,741,000
1939:						
January 28	3,248,250	3,235,000	271,763,000	77,279,000	26,583,000	112,766,000
February 25	3,328,850	3,185,000	271,758,000	84,597,000	23,419,000	110,252,000
March 25	3,382,350	3,225,000	273,915,000	87,561,000	21,487,000	107,551,000
April 22	3,526,700	3,280,000	277,156,000	[2]87,769,000	21,085,000	105,035,000
April 29	3,568,200	3,405,000	278,440,000	86,794,000	[7]25,844,000	108,409,000
May 6	3,580,900	3,275,000	[2]278,607,000	86,216,000	26,167,000	108,597,000
May 27	3,585,250	3,405,000	278,289,000	84,152,000	26,992,000	109,386,000
June 24	3,452,800	3,430,000	272,297,000	81,733,000	30,239,000	111,726,000
July 29	3,539,100	3,460,000	268,513,000	77,887,000	34,900,000	114,053,000
August 5	[1]3,909,400	3,445,000	268,982,000	76,431,000	35,601,000	114,512,000
August 26	[7]1,690,800	3,475,000	246,982,000	73,475,000	37,722,000	116,237,000
September 30	3,658,200	3,560,000	233,023,000	71,168,000	38,081,000	115,466,000
October 7	3,435,850	3,505,000	231,564,000	[6]71,152,000	38,549,000	114,397,000
October 21	3,771,550	[1]3,650,000	[3]229,127,000	72,122,000	39,358,000	115,060,000
October 28	3,498,500	3,520,000	230,453,000	72,660,000	39,562,000	114,786,000
November 25	3,818,100	3,510,000	231,811,000	75,595,000	38,527,000	112,106,000
December 2	3,289,200	3,480,000	234,161,000	76,365,000	37,955,000	110,383,000
December 9	3,827,350	3,460,000	232,016,000	77,196,000	37,087,000	109,291,000
December 16	3,865,750	3,415,000	232,615,000	78,158,000	36,285,000	107,977,000
December 23	3,867,900	3,395,000	236,038,000	78,707,000	35,068,000	107,061,000
December 30	3,545,000	3,445,000	237,742,000	80,985,000	34,184,000	106,680,000
January 6, 1940	3,584,450	3,370,000	.....	82,002,000	32,183,000	105,247,000
January 7, 1939	3,214,900	3,170,000	[4]273,024,000	72,936,000	35,591,000	118,055,000
Change in past year.	+11.5%	+6.3%	—12.9%	+12.6%	—9.6%	—10.8%

[1] All time peak. [2] Peak for 1939. [3] Lowest since April, 1922. [4] Stocks December 31, 1938. [5] Peak prior to 1939. [6] Lowest for year. [7] Lowest since October, 1922, due to the shutdown of six Mid-Continent states.

Smaller crude runs to still help gasoline stocks

The latest statistics of the industry, covering the week ended January 6, reflected a cutting down of crude runs to stills, despite an increase in crude production. Consequently, output of gasoline was lowered, and additions to stocks became more moderate. The smaller refinery runs also resulted in decreased production of fuel oils, and the stocks of both light and heavy oils again were reduced relatively large amounts.

Production and Runs

United States crude production averaged 3,584,450 barrels daily in the week of January 6, according to the American Petroleum Institute, an increase of approximately 40,000 barrels over the previous week's daily average. The new rate was 11.5 percent higher than that in the corresponding week a year before.

Crude runs to stills were reduced 75,000 barrels to 3,370,000 barrels daily in the week of January 6, but still were 6.3 percent higher than one year previously.

Gasoline Situation

Production of gasoline was 34,000 barrels a day smaller, in consequence of the smaller runs to stills, having totaled 11,449,000 barrels for the week.

Stocks of finished and unfinished gasoline in the United States were increased 1,017,000 barrels, having risen to 82,002,000 barrels. At that level, they were 12.6 percent higher than at the corresponding time a year earlier.

Demand for gasoline, meanwhile, shows an increase of only about 5 percent over the level of a year ago.

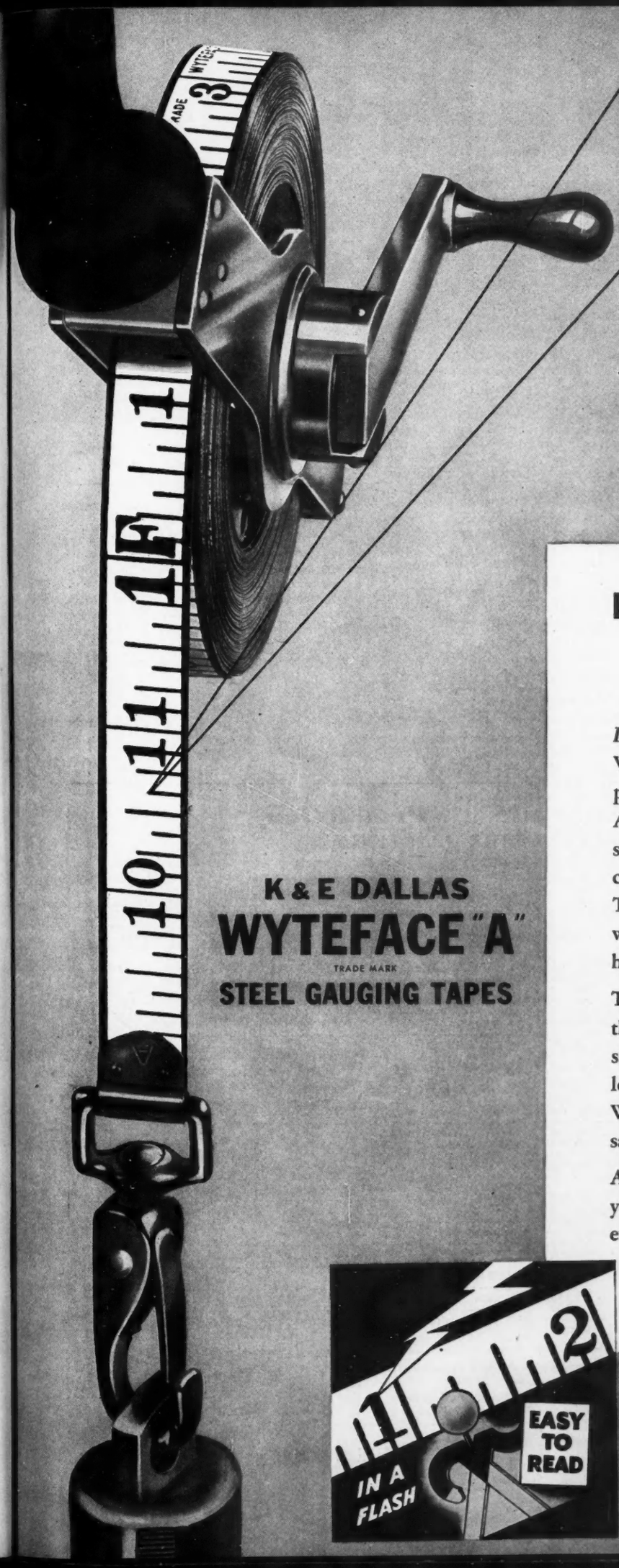
Fuel Oils

Inventories of heating oil were reduced materially again, in response to the large current consumption. Total stocks of gas oil and distillate fuel in the country came down to 32,183,000 barrels, a decrease of 2,001,000 barrels within the week, and then were 9.6 percent smaller than a year before.

Demand for heating oil has been running around 15 percent higher than a year ago.

Stocks of residual fuel oil also came

RAISED METAL GRADUATIONS



K & E DALLAS
WYTEFACE "A"
TRADE MARK
STEEL GAUGING TAPES

Black-on-White Markings
EASY TO READ
RESIST ABRASION

In a flash—you get your reading on a Dallas Wyteface "A". Even in poor light, this improved, steel gauging tape is easy to read. And its *raised* black metal graduations stand up under hard service—in gauging crude; in resisting wear against the hatch. The sandy residues and constant wiping, which shorten the life of an ordinary line, hold little threat for a Dallas Wyteface "A".

The crack-proof white surface is bonded to the steel—protects it from rust and corrosion. Crude oil gives you a well-defined level mark against this white surface. Dallas Wyteface "A" is both a convenience and a safeguard against error.

Ask your Oil Well Supply Dealer to show you this and other Wyteface Tapes—for every oil field requirement. A complete catalog will be sent you, upon request.

EST. 1867
KEUFFEL & ESSER CO.
NEW YORK · HOBOKEN, N. J.
CHICAGO · ST. LOUIS · SAN FRANCISCO · DETROIT · MONTREAL

down materially, as the nation's business and industrial activity remained brisk, having declined 1,433,000 barrels to 118,055,000 barrels. Demand for the heavy oils has been running about 10 percent higher than it did a year ago.

Stocks of crude oil in the United States further increased approximately 1,700,000 barrels in the week ended December 30, the Bureau of Mines reported. They then were 12.9 percent larger than one year previously.

Standard withdraws as purchaser in Mississippi

Standard Oil Company of Louisiana has announced that it will withdraw as a purchaser of crude in the Tinsley Dome field, Mississippi, effective January 31. It has been the sole purchaser since discovery of the field last August. It had announced previously that it would discontinue purchases December 31, 1939, but after a revision of railroad rates, agreed to continue 30 days longer. The oil is being shipped by rail to Baton Rouge, Louisiana.

Sinclair continues to take government's Salt Creek oil

The Interior Department last week accepted the only bid received at a recent opening of proposals for sale of royalty oil from government lands in the Salt Creek, Wyoming, field, awarding a one-year contract to Sinclair Wyoming Oil Company, Tulsa. The company was the holder of the last contract, which ran for three years.

Under the terms of the award the company agrees to pay the government one cent above the Salt Creek posted price or one cent above Mid-Continent posted price for oil of equal or lower gravity as published or offered by at least two of the five major purchasers, whichever is higher.

The royalty oil accruing to the government from the Salt Creek field runs between 625,000 and 700,000 barrels a year.

Refinery operations down in November

A sharp slackening in refinery operations in November brought daily average runs to stills for the month to 3,497,000 barrels, or 83,000 barrels under the October average although 253,000 barrels above that for November, 1938, the Bureau of Mines reported last week.

Total receipts of crude at refineries during the month were 107,475,000 barrels, of which 104,343,000 barrels was domestic and 3,132,000 barrels foreign oil. Daily average of 104,000 barrels of foreign oil was 4000 barrels above that for the preceding month. With runs to stills totaling 104,916,000 barrels and fuel and losses 71,000 barrels, there was a marked increase in stocks. They rose during the month from 46,673,000 to 49,161,000 barrels.

Increased Manvel allowable requested

The Texas Corporation has requested a net increase of 4896 barrels daily in the allowable for the Manvel field, Brazoria County. The oil would be produced from the Oligocene section.

At a hearing before the Texas Railroad Commission, A. W. Baucum, petroleum engineer, said that the additional oil could be produced from the Oligocene without waste. He said he thought the Miocene production should not be increased.

E. P. Hayes, production engineer for the company, said that 9600 barrels daily is used by the refinery to fulfill existing contracts, and the stocks would be 50,000 barrels below normal on January 15. Normally the plant stocks 400,000 barrels of this crude.

Wil-Tex Oil Corporation asked that its three Miocene wells be raised a total of 40 barrels daily. The Oligocene wells are now producing about 56 barrels daily.

Anti-Trust

[*Continued from page 39*]

nation before the senate judiciary subcommittee.

The question of the attorney general's attitude with respect to appeals to the Supreme Court in cases in which, as head of the Department of Justice, he participated was raised by Chairman Burke, who called his attention to reports that the department planned to revive the Madison case.

The attorney general, whose nomination later was approved by the subcommittee, said he did not know enough about the oil case to commit himself, but declared that if he finds he is disqualified he will "lean backward" in that direction.

United States Crude Oil Production

Estimates Compiled by THE OIL WEEKLY

DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (January)	State Allowable in Jan.	BARRELS DAILY FOR WEEK ENDED Jan. 13	Jan. 6
TEXAS—				
Texas Panhandle	.....	.....	87,650	77,200
North Texas	.....	.....	79,450	79,250
West Central Texas	.....	.....	32,050	26,950
West Texas	.....	.....	242,700	228,250
East Central Texas	.....	.....	81,800	81,700
East Texas Field	.....	.....	395,550	396,250
South Texas	.....	.....	204,175	205,750
Texas Gulf Coast	.....	.....	231,625	224,100
Total Texas	1,411,000	1,376,000*	1,355,000	1,319,450
CALIFORNIA—				
Long Beach	.....	.....	45,400	43,000
Midway-Sunset	.....	.....	50,500	44,500
Kettleman Hills	.....	.....	48,100	51,200
Wilmington	.....	.....	85,900	83,600
Others	.....	.....	383,600	379,100
Total California	593,900	599,000†	613,500	601,400
OKLAHOMA—				
Oklahoma City	.....	.....	94,300	107,750
Seminole Area	.....	.....	98,100	110,025
Others	.....	.....	230,700	221,030
Total Oklahoma	433,900	433,900	423,100	438,805
ILLINOIS—				
Salem	.....	.....	182,100	184,250
Louden	.....	.....	74,200	76,100
Other New Pools	.....	.....	71,850	72,500
Old Pools	.....	.....	7,850	7,850
Total Illinois	314,800	.....	336,000	340,700

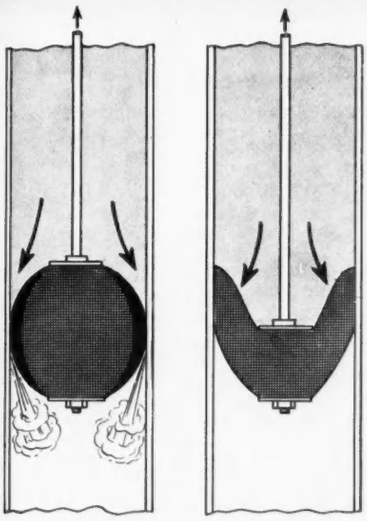
DISTRICT OR STATE	Bureau of Mines Estimate of Daily Demand (January)	State Allowable in Jan.	BARRELS DAILY FOR WEEK ENDED Jan. 13	Jan. 6
LOUISIANA—				
North Louisiana	.....	.....	67,950	68,800
South Louisiana	.....	.....	201,150	199,900
Total Louisiana	254,200	268,192	269,100	268,700
KANSAS	160,600	160,600	167,500	166,400
NEW MEXICO	101,900	101,900	104,250	110,000
EASTERN STATES—				
Pennsylvania Grade	.....	.....	76,250	78,500
Others, Eastern	.....	.....	25,000	26,000
Total Eastern States	100,700	.....	101,250	104,500
MOUNTAIN STATES—				
Wyoming	58,700	.....	63,900	62,800
Montana	15,400	.....	17,000	17,500
Colorado	3,900	.....	4,100	3,800
Total Mountain States	78,000	.....	85,000	84,100
MICHIGAN	61,000	65,000	68,000	67,500
ARKANSAS	59,700	71,200	69,800	70,950
MISSISSIPPI	.....	.....	2,650	2,000
NEBRASKA	.....	.....	100	50
§ Total 8 Prorated States	3,076,200	3,079,792	3,070,250	3,043,205
Total United States	3,569,500	.....	3,595,250	3,574,555

* Daily average, considering Saturday-Sunday-Wednesday shutdowns, and various exemptions.

† Recommendation of Central Committee of California Oil Producers.

§ Texas, California, Oklahoma, Louisiana, Kansas, New Mexico, Michigan, Arkansas.

PRICES REDUCED!
on Guiberson Swabs



Principle of Conventional Swab

Principle of Guiberson Swab

Guiberson Swab takes up its own wear, assuring complete seal even after cup is worn

as much as 35 per cent on some sizes

The Guiberson Corporation is pleased to announce a general reduction in prices on most sizes of Type "K" GUIBERSON Swabs, effective at once. The redution is as much as 35% on some sizes. Substantial savings have recently been achieved in the manufacture of GUIBERSON Swabs, due to steadily increasing volume of sales and the introduction of mass production methods of manufacture. We are passing these savings on to our customers, in the form of lower prices.

Science Improves Guiberson Rubbers

Our customers are assured that the reductions in prices do not involve the slightest sacrifice in the quality of the product. On the contrary, we are also able to announce at this time recent important improvements in GUIBERSON Swab Rubbers, made possible through our program of constant laboratory and field research. The rubber composition used for GUIBERSON Swab Cups has been improved both in tensile strength and in resistance to abrasion. This enhanced cup durability combines with the protection to cups afforded by the Guiberson patented flexible-cup principle to achieve a swab rubber life and serviceability heretofore unknown.

GUIBERSON Does 90% of All Swabbing

The GUIBERSON Swab does 90% of the world's swabbing. The reason for this universal preference is that the GUIBERSON is the only swab which operates on the correct mechanical principle, its flexible cups working with the fluid pressure to perfect the seal between cups and walls of the well. The greater the fluid pressure the tighter the seal. GUIBERSON flexible cups afford these great advantages:

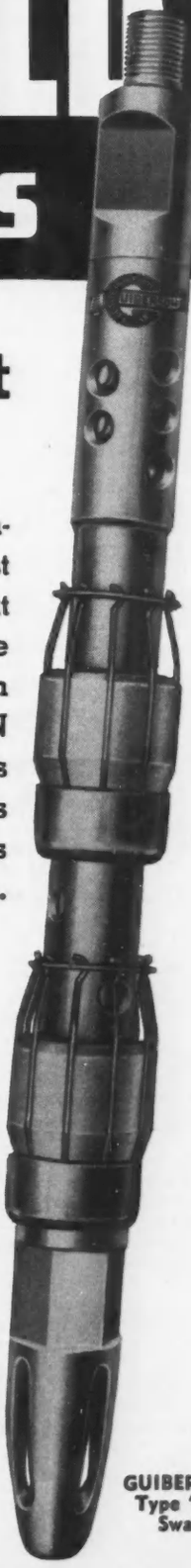
Swab raises full load: runs in faster: runs in without sticking or plugging: raises more fluid per cup life: flexibility lessens wear and lets cup take up its own wear: wire cage and metal reinforcement carry most of load: flexibility reduces friction and wear on pipe to minimum: cups are changed with maximum speed.

For full information on GUIBERSON oil field specialties see 1940 Composite Catalog or write

THE GUIBERSON CORPORATION . . . . . BOX 1106, DALLAS, TEXAS

Tulsa Houston Kilgore Kermit Salem, Ill. Newark, O. Casper, Wyo.

Los Angeles: The W. R. Guiberson Co. Export: I. Frank Brown, New York



GUIBERSON Type "K" Swab

BETTER BE SAFE THAN SORRY GUIBERSON

GUIBERSON

WORLD-WIDE DEVELOPMENTS

Edited by WM. V. GROSS, Associate Editor

Portugal

Exploratory drilling starts on Portuguese concession

Exploratory drilling has started on Anglo-Portuguese Oil Company's concession in the Torres-Vedras region, according to a statement issued by Portugal's minister of industry.

Terms of the original concession, granted to H. J. Pierce and Claude Hope-Morley in April, 1938, provided that preliminary geology and geophysical work must be completed by October 7, 1939, and that selection of a drilling sight must be made within six months of that date. Stipulations further provide that in the event of development of commercial production the domestic needs of Portugal must be taken care of before exportation of any of the oil will be allowed. Anglo-Portuguese Oil Company is capitalized for £250,000, or about $1,250,000.

Any production developed by the above organization will go for 10 years to the refining firm of Redeventza as that concern holds a 10-year exclusive refining concession from the government.

Mexico

Herrera scores lack of discipline in Pemex

Ing. Vicente Cortes Herrera, general manager of Pemex, government controlled company for operation of the oil industry in Mexico, blamed financial losses of the organization on lack of discipline among the workers in a statement published in January in El Mundo, a Tampico newspaper.

Cortes Herrera charged that benefits conceded the workers by the decree of December 17, 1937, exceed by millions the estimate of 26 million pesos per year calculated by the government committee that investigated the matter and whose report was objected to by the expropriated companies as a serious underestimate.

He declared also that the number of men employed has increased from 15,895 with a payroll of 4¼ million pesos in April, 1938, to a total of 19,316 with a payroll of 6½ million pesos monthly, despite the fact that oil treated at refineries has decreased by 25 percent and the amount produced from the wells by about 3.5 percent.

Herrera charged workers at Minatitlan with refusal to operate a plant under conditions established by the management after careful management. He scored the refusal of Tampico local union No. 1 to permit materials to be transferred to another plant that needed them badly. Loss of 16,000 barrels of oil into the sea at Tuxpan because laborers refused to repair a broken line or shut off pumps because they were celebrating a holiday commemorating expropriation and another serious loss of oil from lines at Palmasola due to poor repairs by the welding crew in charge were cited by Herrera. He also mentioned numerous thefts and frauds against the organization by its own employes as reasons for the non-profitable operation of Pemex.

Loss incurred by Pemex during the year is estimated at 80 million pesos, using figures of President Cardenas as a yardstick. He stated that Mexico had sold 247 million pesos worth of oil during 1939, but that costs of operations amounted to 327 million pesos.

Companies reject terms of Mexican settlement offer

Tentative offers of the Mexican government to settle the oil expropriation controversy by the payment of from $10,000,000 to $15,000,000 were reported in Washington last week to have been flatly turned down by the American oil companies involved.

The basis for the offer was made by Eduardo Suarez, Mexican finance minister, who has been in Washington for some days, reportedly attempting to settle the controversy, perhaps in advance of the transmission of a strong note from the state department, which seemingly has become irked over the long delay on the part of the Mexican government in arriving at a conclusion.

It has consistently been pointed out by the department that while the United States recognized the Mexican government's right of expropriation, where proper reimbursement is made, the taking of properties without such reimbursement is an act of seizure which this government cannot recognize as valid.

East Indies

Large concessions to be awarded in Sumatra soon

Advice from The Hague is that Nederlandsche Koloniale Petroleum Maatschappij, an organization producing in excess of 40,000 barrels daily in Netherlands East Indies, soon will receive exploratory concessions on areas totaling 401,650 hectares, approximately 992,075.5 acres, in Sumatra.

One of these, called the Klingi block, embraces 70,400 hectares in an area in Musihulu and Rawas neighborhoods in the upper Palembang district. Another, known as the North Ogan block, consists of 110,000 hectares in the lower Palembang region. A third, consisting of 17,950 hectares and in the Palembang area, is known as the North Benakat block. The fourth and largest grant scheduled to be awarded to the company for exploratory work is the Radja block of 203,300 hectares in the Oganhilir, Musi-hilir and Kosbu districts of the Palembang area.

Wildcat Forerunners

Geologists busied with the search for new structures in Colombia often are forced to depend upon this means of transportation before findings justify installation of more modern means.

U. S. FIELD OPERATIONS

A 75-BARREL well provided a new producing area for Creek County, Oklahoma, with production from the Wilcox sand. Extensions were given the West Seminole and Allen pools. The Hall pool of Russell County, Kansas, had a half-mile extension and a new horizon; Simpson was added to the producing horizons of the Snider pool, and extensions were also given the Bornholdt and Zenith pools.

The Tonti field of Marion County was added to Illinois producing areas with Devonian-lime production, but salt water crowded another Marion County field, temporarily, from the Devonian picture. The Bridgeport sand was added to the deeper Waltersburg and McClosky formations in Indiana's New Harmony field with a well that started at 150 barrels a day.

New importance was given the deep production in Montague County, North Texas, by the second well to drill into the Bend lime. The well is awaiting casing to complete. Lower Strawn at Hull-Silk yielded 800 barrels in 3 hours. In Pecos County of West Texas an Ellenberger test that has a flow of sweet gas and distillate is giving promise of making an oil well. The East Texas field dropped 5.9 pounds of pressure between the last test dates. In Smith County, a wildcat is plugging back after finding nothing but hard drilling in the Lower Trinity. A fourth sand greatly increases prospects for the LaGloria field in Southwest Texas; other important developments in that area include gains in wildcat work in search of Sparta-Wilcox.

In North Louisiana, deep holes at Lisbon and Pine Island which have not been encouraging will get further testing before final abandonment. Extension in two directions appeared probable at Dorcheat in Arkansas, while in Mississippi one of the three wells completed at Tinsley Dome was a mile extension.

Michigan's first discovery of the year is the first for Barry County, and promises a small pumper from a wafer of saturated Traverse lime.

Illinois

Devonian success stirs interest in St. Peter

Centralia, Ill.—Devonian production in Illinois has resulted in a revived interest in the possibilities of the St. Peter sand, the formation which attracted most operators to this state before shallow discoveries were made in 1936 and 1937.

Although operators have not committed themselves as to the depth to which they intend to carry their tests, two St. Peter ventures are now believed drilling. One is Denver Producing and Refining Company's Dennis 1, NW NW SW 14-7n-14w, Crawford County, on a 12,000-acre block which was extensively core drilled several months ago. The test is drilling at about 2000 feet. The other prospective exploration of the St. Peter is in the Cisne field of Wayne County where Pure Oil Company is drilling below 1000 feet in Stella Billington 3, C E½ SE NE 27-1n-7e. The company is also expected to test the Devonian and Trenton, which never have been explored in that area.

Rumors of proposed St. Peter tests for the Lake Centralia-Salem field of Marion County, where Devonian production was recently uncovered, apparently lack foundation.

The Tonti township field of Marion County was added to the increasing number of Devonian pools when Arthur "Tex" Harvey's J. L. Kagy 6, SE 33-3n-2e, began flowing 6 barrels hourly from 3510-30 feet, with swab stuck in the hole. The well had been given acid treatments of 400 and 100 gallons and was to receive another 500-gallon shot before an initial test is made. The Benoist, Aux Vases and McClosky are also productive in the field.

The Patoka field, also in Marion County, moved out of the Devonian picture when J. Hal Jones and C. E. Deaton Majonnier 2, NE NE SW 28-4n-1e, was plugged back to test Rosiclaire lime saturation at 1603-21 feet, after Devonian at 2890-93, 2899-2903, and 2947-50 feet swabbed but two barrels of oil in 24 hours. The hole was deepened 2 feet to 2952 and the well filled with salt water. Production in the field has so far been confined to the Cypress and Benoist sands.

The second and third prospective Devonian producers in the Centralia townsite field have set casing. Burnham & Johnson's Bailey-Marshall 1, Lot 19, Block 2, Pullen Sub. 3, set pipe at 2895 feet after coring 2 feet of pay below 2901 feet. The well will be drilled in with cable tools. Algona Oil Co.'s Skipper-Koehler 1, Lot 4, Block 1, Pullen Sub. 3, set pipe at 2900 feet after pulling a 10-foot core below that depth. Core contained about five feet of saturation. Both tests are within two blocks of the field's deep discovery well and are also outside the city limits in an area where 7 other operations are active.

City commissioners have revised their oil ordinance for the second time and now require operators to post public liability and property damage policies of $10,000-$20,000 and $10,000-$25,000, respectively, for each well drilled, in addition to a $10,000 surety bond. Only venture started in the city limits is J. W. Menhall's test on the Illinois Central right-of-way, 5 blocks East and 5 blocks south of the discovery well. It was rigging up portable rotary tools.

There have been 14 successful Devonian completions in the Lake Centralia-Salem area, the most recent of which are: McBride, Inc.'s V. L. Lee 16, 392 feet from south line and 340 feet from east line, NE SE 29-2n-2e, flowed 3525 barrels in 24 hours from pay at 3404-33 feet after 1000-gallon acid treatment; Kingwood Oil Company's Shanafelt 21-A, 270 feet from south line and 280 feet from west line, NE NE 20-2n-2e, 1154 barrels in 24 hours natural; Magnolia Petroleum Company's J. H. Young 73, Section 29-2n-2e, 3530 barrels in 24 hours, 1000 gallons acid, total depth 3457 feet; The Texas Company's N. Young 21, NW SE NE 20-2n-2e, 598 barrels in 3 hours, rated at 4800 barrels a day, after 1000 gallons acid, total depth 3429 feet; The Texas Company's D. Young 19, 270 feet from north line and 260 feet from west line, S½ NW 21-2n-2e, flowed 490 barrels in 3 hours, rated at 3915 barrels a day, after 1000 gallons acid, total depth 3467 feet.

John Pugh has staked location for a test in the village of Noble, Richland County, a long latent area, on the lease of the Home Oil Co., SW NW SE 17-3n-9e. One well on the lease is producing from the McClosky. Although Pugh's permit specifies a Cypress test, it is reliably reported the well will be taken to the Devonian.

One of the best completions yet reported in the Stokes field of White County is Penn-Illinois Oil & Gas Company's Porter 4, C E½ SE SE 12-6s-8e, which was rated at 1000 barrels a day from the McClosky. It is the company's sixth completion in the field from which Penn-Illinois has already shipped more than 70,000 barrels of oil.

Several operations in the Storms field, also in White County, were shut down because of inadequate outlets for the pool's crude.

An important Wabash County wildcat, Chet Evarts Trapp 1, SE SE NE 6-1s-12w, three miles north of Mt. Carmel, has been abandoned after a test

North Texas

Bend lime indicated important in Nocona deep pool area

Wichita Falls.—Flowing production developed by a second Bend Lime test for the deep pool centering immediately west of Nocona, Montague County, indicated that this lower pay may embrace a greater area and be more consistent than the two Strawn horizons. Sunray Oil Company and Ramsey Petroleum Corporation's Burnett 1, south outpost, flowed pipe line oil into pits through tester used on sandy lime pay at 5224-49 feet. Top of Bend was called at 5209 feet, being 15 feet lower structurally than Stanolind Oil & Gas Company's Davis 2, northwest edge test that missed pay in strawn but flowed 80 barrels per hour natural through ½-inch choke to become the first completion in the Bend at 5230-40 feet. The latter drilled through the saturation to 5255 feet.

Liner will be installed in Burnett 1 before trying for completion as it was drilled with open hole below 7-inch pipe at 4623 feet. Production developed from Lower Strawn at 4634-41 feet late in November declined rapidly and deeper drilling followed the proving of the Bend Zone. Rogers & Rogers' Astley-Texaco 1, midway between the two deep wells logged top of Bend at 5208 feet followed by nominal saturation that was not tested. The latter found water in Ellenberger at 5390-5489 feet then plugged back for flowing production in the Lower Strawn. William Payne et al's Wood 1 and Lesh & McCall's Football Field 1, both on the nearest edge of production, were awaiting completion late last week after logging normal pay section in the 4300-foot sand.

Walter Gant and Continental Oil Company's J. T. Brown 1, western Montague County, was drilling lime and shale at 7235 feet with the Ellenberger as its next objective. This wildcat failed to indicate production when treated with 8000 gallons of acid at 6904 feet, tentatively identified by fossils as being in the Simpson, and formation tester used at 7030-56 feet registered only a trace of oil and gas with drilling fluid. Bottom-hole pressure at the latter depth was calculated at 2550 pounds.

The Bonita 3-pay pool, eastern Montague County, is in line for considerable development as result of the completion of Stanolind Pipe Line Company's 4-inch outlet. The Texas Company's Martin 1, C. A. Barnes Survey, an east outpost, logged top of lime at 1827 feet, and was drilling at 1850 feet. Tom Wade et al's McLaughlin 1, J. L. Graham Survey, has been authorized as a northeast outpost. Benton & Holmes' First National Bank 1, northwest edge of production, is the first of a group of tests proposed for their discovery block. United Producers Company and Continental Oil Company's Custer 1-A, an inside test, was drilling at 2700 feet.

Sinclair Prairie Oil Company's Howard 1, projected 5000-foot wildcat on a block that centers immediately west of the town of Bonita, was drilling at 990 feet.

The Lower Strawn horizon accounted for an outstanding producer in the east central portion of the Hull-Silk field when J. A. Chapman and Ed. McFarlin's Wilson 3-C, NWc Lot 2, ATNCL Section 29, drilled oil sand at 4312-60 feet. The well flowed 800 barrels of oil natural through 7-inch pipe in 3 hours, and is credited with increasing to 280 barrels the last hour of the test. Three earlier completions on the 160-acre lease also registered large initial yields.

The water level in the Strawn was established by Shell Oil Company's H. Henderson 1, NW Section 2605, TE&L Company Survey, southwestern Jack County wildcat, in drilling to 3824 feet. The hole has been plugged back to 3570 feet to run 4½-inch pipe for completion in the 3 oil saturated zones passed up in exploring the Strawn section. Formation tester used on sand at 3419-32 feet late in December yielded 2600 feet of oil in 15 minutes, with 1225 pounds bottom-hole pressure. Smaller oil yields occurred in making separate tests of sands at 3505-29 feet and 3556-85 feet. The middle pay recorded 1300 pounds bottom-hole pressure, and the lower sand tested 1500 pounds. The only Strawn failure for the area is situated 1½ miles south by east, and was drilled by Seitz-Comegys & Seitz's L. S. Wright 1, near C NE Section 2632, to 4112 feet.

L. T. Burns et al's Browning 3, northwest offset to the discovery producer of the Burns-Browning pool, western Clay County, is showing for a small well after plugging back from 4517 feet to 4474 feet. Oil saturation was found in Strawn at 4432-64 feet and 4469-74 feet. Shell Oil Company's Davis 1, south offset to the discovery and a failure in the regular pay, has resumed drilling after swabbing 17½ barrels of oil in 12 hours with the well bottomed at 5106 feet. It was temporarily abandoned last June at 5100 feet, having tested dry after cementing 7-inch at 4923 feet, but oil rose in the hole during the shutdown.

Seminole operators ask for 40-acre spacing

Operators in the Seminole field, Gaines County, requested 40-acre spacing with a 10-acre tolerance at a hearing before the Texas Railroad Commission last week. This would permit drilling of wells 660 feet from lease lines and 1320 feet apart. The regulations proposed, which were approved by most of the operators in the area, would require operators of small tracts to make a bonafide effort to pool before asking for an exception. Raymond Myers, representing Magnolia Petroleum Company, said that the field is now developed on a 40-acre basis.

The operators recommended that a string of casing be set 50 feet below the top of the red beds and cemented to the surface, and that a second string be set to the Yates sand and cemented to the surface, or set below the Yates if the surface string is set below the red beds. The oil string would be set below the gas-oil contact and cemented 1000 feet above the shoe.

Ohio Oil Company, Humble Oil & Refining Company, Osage Drilling Company, Atlantic Refining Company, Amerada Petroleum Corporation, Shell Oil Company, and Sun Oil Company joined in the request made by Magnolia.

Texas permits to drill total 261

Permits for drilling 261 new wells in Texas were approved by the Texas Railroad Commission last week, 221 more than were allowed the previous week.

Nine permits were granted to operators in the East Texas field in Gregg County, while five locations were reported from the remaining section of the East Central Texas area.

North Texas continued to hold first place in the state with 82 permits, including 24 in Archer and 21 in Wichita County. Southwest Texas was second with 51 approved applications.

The commission permitted the drilling of 43 more wells in the Gulf Coast area. Operators in the Panhandle listed 17 permits, including 10 in Gray County.

West Texas producers reported 33 locations wtih 13 in Yoakum County, while 21 permits were approved in West Central Texas.

East Texas lease sale

Kilgore.—Coastal Development Corporation, Tulsa, has purchased Virginia Oil & Refining Company's Bob Woods and Flewellen leases, embracing 300 acres and 21 completed wells situated in the north portion of the East Texas field, for $600,000 cash.

The trade was approved by United States District Court order January 8, and concludes liquidation of the valuable assets of the bankrupt concern.

Virginia Oil & Refining Company was a post-war promotion enterprise that acquired long-term leases in connection with shallow wildcatting efforts of the East Texas field, proved a portion of its holdings for production. Stockholders banded together and through a receiver established lease claims through court action that caused the surrender of acreage developed. The above two leases were repossessed after the wells were drilled.

Texas municipalities not subject to gasoline taxes

In an opinion handed down last week by the Third Court of Civil Appeals at Austin, the court held that Texas municipalities are not subject to taxes on gasoline. Not only is the state helpless to recover taxes under the present law, but it is doubtful that a valid tax law could be passed.

The opinion was written by Judge M. B. Blair. It grew out of a suit brought by the state against the City of El Paso seeking to recover 4 cents a gallon on gasoline used by the city.

West Texas

Pecos County Ellenberger wet gasser may change to oil well

Midland, Texas.—Conversion of a wet gasser into an oil producer from the Ellenberger appeared promising late last week for the northern Pecos County wildcat of Olson Oil Company and Bryce McCandless on the Crockett tract, T. C. Section 5, Block 110. Dolomite lime cored at 4482-99 feet yielded good porosity and saturation at intervals to bolster the prospects of an oil well after testing 3,555,000 feet of sweet gas with light spray of 44-gravity oil at 4461-79 feet. Top of Ellenberger was logged at 4405 feet, although electric log places this marker at 4390 feet with an elevation of 2461 feet. Crockett 1 is 2½ miles south by west of the Apco deep pool, which has a thin section of Ellenberger overlying basement rock. It will be deepened before making a production test of the lower pay.

Humble Oil & Refining Company's Young 1, scheduled Ordovician test for a Pecos County block, was drilling at 3320 feet, with the Ellenberger due near the 5000-foot level.

Additional tests authorized the past week by Gulf Oil Corporation boosts its total to more than a score since the first of the year. All were assigned to virtually proved locations, except University 1-K, NWc NW Section 2, Block 31, Crane County wildcat and 2½ miles west of the Dune field. It is due to be carried to Lower Permian if necessary, as the company has considerable acreage in the area. Greater depth penetration of the Permian is justified by favorably situated prospects in the Crane-Ector County sector of the basin as the Tubb and Holt pays are considerably below the sulphur-water level in the Upper Permian.

New operations slated for the Wasson field, centering upon the Gaines-Yoakum County line, reveal that it will continue to be one of the most active drilling centers with about 60 rigs in service. Drilling is largely confined to inside locations. There is a threat of pipe line proration being revived next spring unless additional pipe line outlet is forthcoming. An independent line is due to be completed in March.

The Todd area, Crockett County, has 3 shallow tests underway that are being drilled to perpetuate leases that embrace a portion of the Ordovician structure, and there are 2 Ordovician projects. Continental Oil Company et al's Todd 1 is awaiting large nitro shot after plugging back by stages from 7010 feet to 6336 feet. Small show of high-gravity oil appeared with rotary returns while circulating at the latter depth. The shot will be placed near the Simpson-Ellenberger contact at 6256 feet. The partnership's Todd 2, scheduled Ordovician test for the 4480-acre unit block, was drilling at 450 feet. Stanolind Oil & Gas Company et al's Todd 4-30, south offset to the deep test, is running tubing packer to exclude upper gas and complete in oil pay at 1215-25 feet. It will qualify as a discovery, having flowed 73 barrels of 21-gravity oil in 7½ hours with gas volume rated at 3,600,000 feet daily. The flow dropped to 31 barrels on 4-hour gauge when the hole was deepened from 1219 feet to 1220 feet. Todd 5-67 was drilling at 550 feet, and Todd 1-32, also seeking shallow oil or gas, was drilling at 880 feet.

Foster Test Getting Deep

York & Harper and The Sloan & Zook Company's Foster 1-D, SW NW NE T&P Section 8, Block 42, first deep test for the Foster field, Ector County, was nearing a decisive level for production in the Holt pay in drilling at 5240 feet. No shows have been reported below the regular Permian pay, which failed to yield commercial production due to the absence of porosity in this particular test. The Holt pay, identified as Lower Middle Permian, accounted for 3 flowing producers on the west flank of the North Cowden field last year, and is rated as a good prospect for other Ector County fields. Stanolind Oil & Gas Company's W. F. Cowden 1, deep test and 2¼ miles northwest of the North Cowden deep discovery, was drilling at 3950 feet, having logged top of Yates at 2790 feet with an elevation of 3115 feet. It is 54 feet higher on this marker than the discovery. The company paid $125 per acre, one fifth cash, for lease on 1000 acres to support this deep test obligation.

Expansion of the North Cowden regular pay to the northeast continues to afford a favorable outlook as result of Broderick & Calvert's O. B. Holt 9-A, near SW NE SW T&P Section 17, Block 43, registering a potential of 1807 barrels after 420-quart nitro shot at 4244-4390 feet.

Oil Well Drilling Company's Sikes-Humble 1, Gaines County wildcat, is credited with being low on structure in logging top of anhydrite at 1920 feet and first salt at 2040 feet, with an elevation of 3364 feet, and was drilling at 2660 feet. Stanolind Oil & Gas Company's Riley 1, northwest outpost for the Cedar Lake pool, filled with oil after removing cavings caused by 730-quart nitro shot at 4762-4864 feet. It will be acidized to try for a steady flow. Small oil yield by this semi-wildcat, and the absence of gas above and in the oil zone will retard development of adjacent leases.

New and deeper sand found in Carlisle test

Abilene, Texas.—A new oil horizon for the Carlisle pool, Stonewall County, was uncovered by W. I. Southern, Inc.'s Carlisle 2, 1800 feet northwest of the 5100-foot discovery, in drilling saturated lime at 6185-6200 feet. This lower pay has been tentatively identified as the Bend series. Five-inch pipe is being lowered for a production test.

Shell Oil Company's Smith 1, only active wildcat in Stonewall County, is lowering 7-inch to bottom at 6210 feet, to continue to the Ordovician. Small show of 36-gravity oil appeared from sand at 4395-4401 feet, but decreased when pipe was lowered to 4371 feet for a test.

Plugging orders were issued the past week for Plymouth Oil Company's McClure 1, Nolan County wildcat, 2½ miles east by south of Roscoe, after becoming the first test on the east platform of the Permian Basin to drill through the Ellenberger to Cambrian sand, logged at 7435-7453 feet. Top of Ellenberger was called at 6965 feet, with an elevation of 2396 feet. No shows of any consequence were encountered by this unusually deep test for the district.

East Texas

Smith County test plugs back from Lower Trinity

Tyler.—Shell Oil Company's Campbell 1, 2½ miles northeast of the Chapel Hill gas-distillate producer, eastern Smith County, is slated to plug back and try for a gas completion in Paluxy at 5785-5821 feet after coring 90 feet of the Travis Peak section to 8337 feet. The last 22 feet of this zone was quartzitic sandstone that proved extremely hard. The Lower Trinity series offered no encouragement for production.

Sun Oil Company's Huddle 1, two miles south of the producer, was coring at 5550 feet having logged top of Georgetown at 4357 feet.

Shell Oil Company's Dorsey 1, first Trinity project for the Percilla pool, northeastern Houston County, was awaiting orders with section of drill pipe lost in hole at 9766-9884 feet. Electrical log placed the top of massive anhydrite at 9650 feet with no porosity recorded from this depth to the top of the junk. It is likely to be plugged back to try for completion in the Upper Glen Rose which yielded good show of oil when tester was used at 8541-76 feet.

Limestone County has two active deep tests. Peyton Brothers et al's Harris 1, near west edge of the Mexia field, succeeded in sidetracking lost stem at 4495 feet and was drilling at 4620 feet. Murray Samuell and Zephyr Oil Company's Barron 2, half mile northeast of their deep gas-distillate discovery, was drilling at 3800 feet. Lone Star Gas Company began buying gas from the producer the past week.

Harry Moss and William McGlothlin's Venters 1, first Trinity test for Camp County, was drilling shale and anhydrite at 6930 feet.

East Texas pressure dropped 5.9 pounds during last month

Kilgore.—Reservoir pressure in the East Texas field dropped 5.9 pounds during the month ending January 8, according to survey conducted by engineer of the Texas Railroad Commission. The average for the field, based upon readings taken from 91 key wells was 1060.5 pounds on the above date, as compared to 1106.78 pounds on January 8, 1939. The December 8 report listed a drop of 4.42 pounds after three preceding months showed a drop of 56.88 pounds as a sequel to the build-up that occurred when the field was shut in 14 days in August.

Southwest Texas

Kelsey and Sun production may be connected by wildcat

Edinburg.—Extension of the Kelsey and Sun pools to connect with each other appears possible as a wildcat between these areas shows for a probable producer. The test is one of the most important ever drilled in the Rio Grande Valley trend.

Sun Oil Company's E. Rodriguez 1, Santa Teresa grant, Starr County, ran a drill-stem test at 4582-4601 feet in which 70 feet of mud was recovered under 85 pounds working pressure in 20 minutes. The well was coring ahead to lower sands. This well is 5 miles northwest of the Sun field and 8 miles southwest of the Kelsey field. It long has been considered that the two areas are on the same general structure, hence this completion would tend to connect the two producing zones.

W. R. Davis & Company continued to open new oil sands in the Rincon area of Starr County. Slick 2-A was still testing through perforations at 3826-39 feet. Slick 6-B was a completion in the same new sand at 3855-68 feet, jetting 122 barrels of oil per day. Slick 7-B, after being perforated at 4135-45 feet, flowed slightly in excess of 400 barrels per day through 3/8-inch choke under 1350 pounds tubing and 1500 pounds casing pressures.

Sparta-Wilcox exploration work shows further gains

San Antonio.—Sparta-Wilcox operations in South Texas showed further gains as new locations were staked during the past week. Anderson-Prichard Oil Corporation and Mills Bennett will drill Robinson 2, Section 6, in the West Tuleta field of Bee County. The company drilled Robinson 1 to 7921 feet, drill-stem sticking when the test attempted to blow out. The well was believed to be in the top of the Wilcox formation at this level.

In Colorado County, Davis & Company's McLane 1A, on the Garwood prospect, is drilling near 10,500 feet on a project to that formation, the expected depth being around about the level. It is the deepest Wilcox sand test ever drilled in South Texas.

In DeWitt County, Atlantic Refining Company's Pearl McConwell 1, Charles Lockhart Survey, was drilling below surface casing. Shell Oil Company is drilling a test to the northeast on the Lavaca County line.

Bee County is the center of the Wilcox play. Union Producing Company's Ray 56, in the Tomnas Hansen Survey in the old Pettus field, is to be carried to 8500 feet. Thirty miles southwest, Bunte Brothers' Earnest 2, in Bee County School Land Survey, Abstract 103, is to be carried to 9500 feet. It is to start after the first of the month.

Tidewater Associated Oil Company is to make another location on the Bruni prospect where Bruni 7 was carried to 8959 feet. This well stuck drill pipe when the well tried to blow out. It now is being completed as a distillate producer in an upper sand. Sinclair Prairie Oil Company shortly is to drill a well on the Callagahan ranch in the northeast corner of the county.

Fourth sand enhances importance of La Gloria area

Corpus Christi.—The fourth horizon in the new LaGloria field, Jim Wells County, makes this area look like one of major proportions. Magnolia Petroleum Company's C. C. Hornsby 1, north offset to the discovery well, cored the sand at 6070-6100 feet and was completed through perforations at 6085-71 feet, flowing 44 barrels of distillate in 24 hours through 3/16-inch choke under pressures of 2125 pounds on tubing and 2325 pounds on casing. It plugged back from 7227 feet after showing salt water in the 7100-foot sand. The company has drilled five wells in the field, abandoning one and completing four others in different sands.

In the Magnolia City field, Myers et al's Reynolds et al 2 was completed at 5692-5708 feet as the second producer in the deep sand. It flowed 114 barrels per day through 1/8-inch choke under pressures of 750 pounds on tubing. This well indicates that the new deep sand will cover a wide area.

In Nueces County, Hiawatha Oil & Gas Company's Smith 8-B, in the Saxet field, has exceeded 10,600 feet and may be carried considerably deeper. A producer below this level will make it the deepest in South Texas.

An effort to extend the Robstown field of this county one mile north failed when Shield Oil Company's Mienholdt 1 was carried to 6005 feet without finding sand. Preparations were being made to drill deeper.

W. Stewart Boyle's Meyer 1, northwest outpost, and possible discovery of a new sand for the Victoria field, Victoria County, was continuing to test through perforations at 4776-79 feet. Opening a new sand, it flowed 32 barrels of oil in 2 hours through 5/16-inch choke under 75 pounds tubing and 700 pounds casing pressures, then went dead. It is being rigged to pump. After flow valves were installed, Trinity Drillers, Inc.'s Moeller 1, discovery of oil production in the 2500-foot gas sand of the above field, was making 28 barrels of 28-gravity crude per day.

Twenty-acre spacing sought for Tomoconnor

Standard 20-acre spacing for wells in the Tomoconnnor field, Refugio County, was requested at a hearing before the Texas Railroad Commission last week. The program was offered by Humble Oil & Refining Company and was approved by several other operators.

Straight acreage proration was recommended, with a maximum of 25 acres assignable to one well for proration purposes.

Humble recommended that the commission require 1000 feet of surface casing set with 350 sacks of cement and an oil string set with 500 sacks of cement.

A. M. Grant, geologist for Humble, estimated the productive area of the Tomoconnor field at 12,290 acres, with the field about two-thirds developed now. Production is from the Frio found between 5800 and 5900 feet.

The field is water driven, but the gas in solution contributes to the energy used in lifting the oil. Average gas-oil ratio in the field is 700/1, and the oil is 35 gravity. Permeability varies from 1800 to 3200 milli d'arcys, which is unusually high.

Although faulting has been observed, especially along the northwest edge of the field, the productive horizon is a blanket sand with relatively few shale breaks. The bottom hole pressure is 2625 pounds, approximately 100 pounds below virgin pressure. There are 410 wells in the field, and the pressure has risen 20 pounds since September, 1935.

Union Producing Company requested that the commission's order be so prepared that it will enable that company to recover its oil with the four wells now drilled on an 88-acre lease. Rayburn Thompson, attorney for the company, said that a fifth well was impractical.

Kiowa lease sale

Tulsa.—Sealed bids on 9825 acres of oil and gas leases will be opened at the Kiowa Indian Agency, Anadarko, Oklahoma, at 10 o'clock, January 25. Included in this sale are 61 tracts in Caddo County, 8 in Cotton County and 6 in Tillman County.

FOR OIL MEN IN NEW YORK . . .

Located in the Grand Central District, only three blocks from Rockefeller Center, The Beverly is exceptionally convenient for oil men in New York. One of the finest hotels in the city, it offers luxurious accommodations at moderate prices. Each suite from 1 to 5 rooms has spacious and beautifully furnished rooms, one or more private baths and generous closet space. Air-conditioned restaurant and bar.

Single from $4 . . . Double from $6 . . . Suites from $8

Special Monthly and Yearly Rates

W. K. Seeley, *General Manager*
50th St. at Lexington Ave.
New York
OPPOSITE THE WALDORF-ASTORIA

THE *Beverly* HOTEL

Texas Gulf Coast

Continue test of Ft. Bend County outpost

Houston.—Over 3 miles northeast of the discovery well at Rosenberg, Ft. Bend County, Magnolia Petroleum Company was making another production test on Huntington 1, H. Scott League. The well had been perforated with 38 shots from 8246-50 feet and was cleaning into burning pits through a ⅜-inch choke. It was making distillate and gas. A week ago the well was perforated at 8246-50 feet with 24 shots and made an estimated three barrels of 62-gravity distillate per hour through a 9/64-inch choke. Tubing pressure dropped from 1450 pounds to 150 pounds, and casing pressure from 1750 pounds to 200 pounds.

About 1600 feet west of the Rosenberg discovery well, Fred Browning's Socha 1 was waiting on cement after running 7-inch casing to 8195 feet. Tubing will be run for a production test. Broken sand was cored at 8190 feet. North of the town of Rosenberg, R. N. Ranger's Sugarland Industries 1 was drilling in shale and sand at 6350 feet. Salt water sand was found at 5929 feet.

A new deep sand was found on the flank of Esperson dome, Liberty County, when General Crude Oil Company's Fee 9-B blew out at 8314 feet. When the test drilled into the sand, it started "kicking" and then blew out and caught fire. The well burned for 18 hours before it bridged and extinguished itself. Derrick and other drilling equipment was ruined. The well was making an estimated 1000 to 2000 barrels of oil daily and from 40,000,000 to 50,000,000 cubic feet of gas while burning. The hole did not crater.

One mile south of Mackay, Wharton County, J. F. Hutchin's Borden 2, E. M. Cox Survey, was coring in shale at 4900 feet. Being drilled tight, it is reported that sand with a slight show of oil and gas was cored around 4760 feet and a drill-stem test showed a little gas.

On the northwest side of League City field, Galveston County, Phillips Petroleum Company's Stewart Title Company 4 was brought under control after blowing out at 11,270 feet. The well made gas, distillate and salt water. A Christmas tree was installed and a flow line run out to the burning pit. It is not known where the sand is that caused the blowout. The company is testing Brittmacher 1 at League City. It was perforated with 13 shots at 8712-15 feet and flowed 101 barrels daily, of which 83 barrels were salt water, through a ⅛-inch choke with a tubing pressure of 800 pounds and a casing pressure of 1250 pounds. Hole was drilled to 10,348 feet and casing set around that depth. Same operator's Rice 2, League City, was mixing mud at 11,411 feet and will go deeper.

Sun Oil Company has made its first location in the Gulf of Mexico, Galveston County. State 1-26 is in Section 26, 138 feet north of the north line of the section and 292 feet east of the east line of Cade Estate 2326-acre tract.

Glenn H. McCarthy is still testing Salmon et al 1, 2200 feet northwest of production at Anchor, Geo. Robinson Survey, Brazoria County. The outpost test was perforated last week at 9808-24 feet with 20 shots and it came in flowing 5 barrels of distillate per hour through a 21/64-inch bottom hole choke and a ¼-inch top choke. Tubing pressure was 2750 pounds and casing was sealed.

Glenn H. McCarthy's Andrau 1, ¼-mile southwest of the discovery well at Chocolate Bayou, H. T. & B. No. 5, Brazoria County, was drilling in shale below 10,600 feet. Electric log showed possible sands at 9970 feet, 10,000 feet, 10,118 feet, 10,135 feet, 10,280 feet and 10,390 feet.

Humble Oil & Refining Company has completed its first 10,000-foot producer in the Texas Gulf Coast. Six thousand feet northeast of the discovery well at Anchor, Brazoria County, Mettler 1, J. J. De Valderas Survey, flowed 474 barrels of fluid daily, 13 percent salt water and the balance 28.5-gravity oil, through a ¼-inch choke with tubing pressure of 800 pounds and casing pressure of 1450 pounds. The well was completed in Frio sands after casing was perforated with 12 shots at 10,490-494 feet.

In the Willis area, Montgomery County, Sturm & Womach's Foster 2, A. Pevehouse Survey, was drilling in shale below 6300 feet after running an electric log to 5226 feet. The wildcat had an odor of gas in a sandy shale formation at 5827-37 feet.

Gulf Oil Corporation has abandoned Roberts 1 in the Cypress area, Harris County, at 7583 feet in shale. The wildcat had a show of distillate at 6920-30 feet and salt water at 6513-45 feet.

Gulf Oil Corporation has established a new deep drilling record for wells at Hull field, Liberty County. Phoenix Development Company 115, logged a deeper sand which will probably be tested after geophysical work has been completed in the hole. Bottom is at 8166 feet in salt, topped at 8113 feet. Geophones are being run to bottom to outline the salt plug. A sand was cored at 6250-85 feet.

Ask twenty-acre spacing for Rosenberg

Humble Oil & Refining Company requested temporary 20-acre spacing for wells in the new Rosenberg field, Fort Bend County, at a hearing before the Texas Railroad Commission last week. The temporary rule was requested to allow further development before permanent rules are entered, according to Rex Baker, attorney for the company.

Land owners in the area, through a petition, protested the promulgating of permanent rules until the field had been defined.

P. H. O'Bannon, geologist for Humble, said that the field is a deeply buried elongated anticlinal structure producing from the Cockfield. The sand varies between 30 and 50 feet in thickness, and he estimated the porosity between 25 and 30 percent. He thought permeability would be between 1500 and 2500 millidarcys.

The discovery well, drilled by H. C. Cockburn, was drilled to 7743 feet and now produces approximately 1,000,000 feet of gas and 40 barrels of 61 gravity oil daily. Because several surface sands may be loaded with gas, O'Bannon expressed the opinion that the wide spacing was advisable as a safety measure, and that it would prevent blowouts from spreading to other wells in the event they occurred.

S. F. Holmesly, Humble petroleum engineer, recommended 1200 feet of surface casing cemented to the surface and an oil string cemented 600 feet above the shoe. No method of allocation was discussed at the hearing.

Louisiana Gulf Coast

Delta Farms wildcat plugs back

Lake Charles.—After showing gas and distillate in the deepest horizon logged in Tide Water Associated Oil Company's Delta Farms 1, Delta Farms area, Lafourche Parish, operators have plugged the wildcat back to perforate and test at 11,313-20 feet. During the week, the potential discovery was perforated with 100 shots at 11,780-800 feet and made a 23 minute drill stem test through ¼-inch chokes. On using a 3600-foot water cushion, recovery was 30 feet of distillate and 400 feet of mud and water. Pressures were 2400 pounds. Delta Farms 1 was drilled to 11,844 feet in shale and 7-inch casing was set at 11,835 feet. Several oil sands showed up on an electric log. They will be tested before the wildcat is finally completed.

Plymouth Oil Company will probably run 7-inch casing to 8246 feet, the bottom of McHugh Heirs 1, Bayou Pegion area, Iberia Parish. The wildcat cored sandy shale, no cut at 8086 to 8101 feet; shale at 8101-05 feet; sand and shale, no cut at 8105-20 feet; shale at 8120-25 feet and sand shale, 10 percent sand with odor of oil, at 8125-40 feet. The potential discovery well has made drill stem tests at 7277 feet, 7950 feet and 8050 feet, and each has showed oil which probably can be produced in commercial quantities when a production test is made.

Gulf Oil Corporation's Buras Levee District 1-D, West Bay area, Plaquemines Parish, logged sand with odor of oil at 9882-84 feet and were still in the formation. When sand was logged, oil showed up on the ditch and the mud was gassy. This wildcat is being watched with much interest.

Royalty prices are reported to have skyrocketed at Erath prospect, where

The Texas Company's Vermilion Parish School Board 1 logged a gas and distillate sand around 10,450 feet. The wildcat was finishing a fishing job last week.

White Lake Prospect, Vermilion Parish, will receive another wildcat by Louisiana Land & Exploration Company. Location was made for Walter White Heirs 1 in Section 17-15s-1e. The company has drilled two dry wells on this prospect.

New Sand Showing

At Grand Bay in Plaquemines Parish, Gulf Oil Corporation is attempting to open a new producing sand. Grand Prairie Levee District 6-A was perforated with 29 shots at 10,022-82 feet and the well flowed 20 barrels of fluid per hour, 30 percent salt water, through a 3/16-inch choke with a tubing pressure of 1425 pounds. The well was killed and cement pumped into the salt water sands to shut off the salt water flow. Another production test will be made during the coming week. The 10,022-foot sand is the deepest yet found in the field.

Shell Oil Company continues to core new oil sands in Jeanerette Lumber Company 4 at West Lake Verrett, St. Martin Parish. Last week the well logged sands and made a drill stem test at 8853-59 feet and recovered 18 stands of 34.7 gravity oil, two singles of oil and mud and no salt water. The test was made through ¼-inch chokes in 10 minutes. Bottom hole pressure was 3700 pounds. A drill stem test on the well at 8858-69 feet showed three stands of oil cut mud and 11 stands of salt water in 10 minutes through ¼-inch chokes. It also showed a good blow of gas.

In St. James Parish, Shell Oil Company has set casing at 11,402 feet in L. & I. 1 after coring a gas sand at 11,318-58 feet. Five-inch casing will be perforated for a production test.

Another wildcat was abandoned on the Amelia prospect, Assumption Parish, by Shell Oil Company. C. E. Ells 1 was plugged at 11,561 feet in shale. The company's first wildcat on the prospect was abandoned below 11,600 feet.

Amerada Petroleum Corporation is testing a new sand at Bayou Des Allemands field, Lafourche Parish, in Gheens 3. After setting 5-inch casing at 7548 feet, operators perforated casing with 40 shots from 7470-80 feet. The well came in making 162 barrels of fluid, 60 percent salt water, through a 5/32-inch choke with a tubing pressure of 325 pounds and a casing pressure of 1250 pounds. The company is still testing.

In Cameron Parish and in Calcasieu Lake, Superior Oil Company has made location for State 1, wildcat, in Section 1-14s-9w.

Continental Oil Company has four tests in the Wilcox formation at Ville Platte, Evangeline Parish, and has 6-inch casing set in the deep formation at each well. The wells will not be tested in the Wilcox, but will be tested in the upper sands (Sparta). Fontenot Deshotels 2 is bottomed at 10,310 feet and is testing at 8965 feet; H. Haas 4 was down to 10,393 feet and was testing at 8898 feet; W. L. Tate 2 was down to 10,582 feet and waiting on cement to set, and J. E. Vidrine 1 was also waiting on cement to set at 10,427 feet.

Atlantic Refining Company's Whitmer 1, Section 26-3s-11w, was a wildcat location for the Neal area of Beauregard Parish. It will be taken to the Wilcox.

Gulf Refining Company has made its first location at Eola, Avoyelles Parish. It is on the northwest side of the field in Section 1-2s-2e and will be drilled to the Wilcox.

Louisiana permits

Seventy-four drilling permits were issued last week by the Louisiana Conservation Commission of which 25 were in North Louisiana, divided among the following parishes: Bienville, 1; Bossier, 2; Caddo, 17; Sabine, 1; Union, 2; and Webster, 2. Those in South Louisiana were in the following parishes: Acadia, 3; Assumption, 1; Avoyelles, 3; Beauregard, 6; Calcasieu, 6; Iberia, 3; Jefferson, 6; Jefferson Davis, 2; LaFourche, 5; Plaquemines, 3; St. Charles, 1; St. Landry, 1; St. Mary, 5; Terrebonne, 3, and Vermilion, 1.

North Louisiana

Deep holes at Pine Island and Lisbon get more testing

Shreveport. — Lisbon Exploration Company last week prepared to make a series of additional production tests at Roberta Vaughan 1, NE NW 36-21n-5w, first Lower Marine well completed in the Lisbon field, Claiborne Parish. Total depth is 8901 feet. The well was completed several weeks ago making 68 barrels of distillate and 4 million cubic feet of gas daily and has been shut in since shortly after completion.

After first test of the Travis Peak at 3910 feet showed only mud, Stanolind Oil & Gas Company was testing the same level again in Dillon Heirs 131, C SW NE 14-21n-15w, Caddo Parish, Pine Island field, that was drilled below Permian salt to 11,418 feet and then plugged back. A series of tests of the Lower Marine series proved fruitless.

Bienville Wildcat Starts

Harry Hanbury and Standard Oil Company of Louisiana spudded their Travis Peak wildcat test in Bienville Parish, Holstun Unit 1, NEc SW NE 29-18n-6w. In the Shreveport field, Caddo Parish, C. H. Lyons' Louisiana Real Estate & Development Company 1, SW NE 35-18n-14w, has set final casing. It is the field's only active operation.

Union Producing Company's Tensas Delta A-1, NE SW 8-22n-4e, Morehouse Parish wildcat, which logged base of Permian salt at 9082 feet (elevation 71 feet) waited orders at 10,475 feet.

J. K. Wadley and associates are

A Landmark Vocalizes

We know an important bank that was governed with an iron hand by its president—a typical one-man institution. The man died. The bank goes serenely on. Before that now historic "bank holiday" with which Roosevelt launched his regime, we all knew large institutions which have since failed, leaving hardly a ripple. No man and no institution is indispensable. But for thirty years we have tried to conduct this business so that every customer will miss us like the devil if the time ever comes when the stuff for drilling and producing wells in our area can no longer be had from PELCO.

PELICAN WELL TOOL & SUPPLY CO.

SHREVEPORT LOUISIANA

PELCO

Houston
Greggton
Houma
New Iberia
Magnolia

rigging for a 2800-foot wildcat on a 2,000-acre block in Bossier Parish, Norwood Vance 1, SWc NW SW 4-19n-13w.

The Hunter Company of Shreveport assembled 7500 acres of wildcat acreage centering around Section 22-20n-10e, West Carroll Parish, for a test in 90 days. It will go to 3500 feet.

Ohio Oil Company is renewing leases in Township 12 north, Range 15 west, DeSoto Parish.

Six miles south of Waterproof, Tensas Parish, John Dale, Jr., has taken geophysical option on a large block.

Arkansas

Dorcheat field extensions promised in two directions

El Dorado, Ark.—Promise of a quarter-mile northeast extension of the Dorcheat (Experiment) Smackover lime oil field in Columbia County, was given last week by Superior Oil Company's Martel 1, C SW SW 10-18-22, that looms as the field's fourth oil well. Smackover lime porosity was logged at 8814 feet and 7-inch casing was set at 8860 feet, 5 feet off bottom.

A similar distance north of production in the same area, Shell Oil Company had a fishing job at W. P. Keith 1, C SE SE 9-18-22, which was drilled to 8879 feet. A drill-stem test at 8856-69 feet showed 120 feet of oil of 46.5 gravity and 870 feet of mud, oil and water. Later another test at 8864-79 feet showed 150 feet of 42-gravity oil and 540 feet of mud, oil and water with a sulphur cut.

On the west side of the Magnolia field, Columbia County, Arkansas Fuel Oil Company was retesting King B-2, SE NW 21-17-20, after the first test showed 90 percent salt water at 7678 feet. It was plugged back 6 feet for another test.

Standard Oil Company of Louisiana's Petty Stave Company 1, SE SE 4-17-21, at Big Creek, Columbia County, completed recently as a gas/distillate well in the Smackover lime at 7999 feet, was shut in after having produced its temporary allowable of 1800 barrels of distillate. The Arkansas Oil and Gas Commission is expected to hold a hearing soon to determine a regular allowable for this well and subsequent wells in that area. This well, on a geophysical prospect, is the only well so far drilled there.

Georgia

Spud wildcat test on big Clinch County, block

Jackson, Miss.—On a block of approximately 70,000 acres, Georgia Resources, Inc., had spudded Gillican 1, Land Lot 200, District 12, Clinch County, Georgia, and several miles east of this location, John M. Wilson of Tulsa, Oklahoma, has taken a 20,000-acre block.

Mississippi

One of three completions extends Tinsley Dome a mile

Jackson, Miss.—Three oil wells were completed last week in the Tinsley Dome field, Yazoo County, to bring to 12 the number of oil wells in this first oil field for Mississippi. One well extended production slightly over one mile north.

The extension well is E. C. Johnston's Brumfield 1, SE SE 2-10n-3w, completed at 4832 feet, flowing 90 barrels of oil the first hour. A 24-hour gauge was not immediately made.

Jones & O'Brien's Jennie Stevens B-2, NW SW 12-10n-3w, drilled to 6134 feet and plugged back after electrical log was run to bottom, perforated 7-inch casing set at 4499 feet in the Woodruff sand from 4396-4404 feet. The test also showed the lower sand from 4839-51 feet. It was completed flowing 17 barrels per hour through ¼-inch choke.

Union Producing Company's G. C. Woodruff 4, C NE SE 13-10n-3w, after perforating casing at 4694-4793 feet flowed 24 barrels of oil per hour through ¼-inch choke with casing pressure 310 pounds and tubing pressure, 340 pounds. Three other operations were at the testing stage in this field.

B. F. Melat, Trustee, is moving in materials for a 3000-foot wildcat test on a 6000-acre block in Lauderdale County, location being Lockard 1, SW SW 26-7n-15e.

H. D. Easton, Jr., of Shreveport took 25,000 acres of wildcat leases in Franklin County, Alabama, located in Township 8 south, Ranges 11, 12 and 13 west. Leslie B. Moss is leasing in Issaquana County, Mississippi, and A. M. Prickett of Indiana is leasing in southeastern Montgomery County. Gardner Green of Laurel, Mississippi, is leasing in Wayne County, south of the town of Shubuta.

New Mexico

Upturn noted in new drilling in Lea County

Hobbs.—An upturn in development of Lea County fields occurred the past week with the authorization of 12 tests for 8 areas as compared to a total of 7 the previous week. The prolific lime horizon near the intersection of the Penrose and Eunice prorated sectors is commanding a large share of the new work as small leases are forcing progressive offsets.

Reduction of the state allowable to 101,900 barrels daily effective January 1, representing a cut of 8100 barrels was distributed among Lea County wells while Eddy County fields were increased 935 barrels for a new record yield of 14,299 barrels daily. The latter includes 30 wells in the Maljamar field near the Eddy County line. This change caused the top allowable of prorated wells in Lea County to decline 5 barrels to 40 barrels daily, a record low quota, while the Eddy district's top allowable per well remained unchanged at 65 barrels daily. Only 142 wells in the latter can make their maximum quota.

A shift by crude purchasers in their nominations for Lea to Eddy County has been evident for some months since Eddy County oil is posted at a lower price and average gravity is above the common stream from Lea County.

Expansion of the Vacuum field to the southwest was assured when The Texas Company's State 1-AA, C NE NW 3-18s-34e, logged normal pay section in coring to 4750 feet. Tubing has been landed to complete. A northeast extension is involved in the drilling of Magnolia Petroleum Company's State 3-P, C NW NE 26-17s-35e, which has cemented 7-inch pipe at 4146 feet after checking favorably on geological markers.

Texas Pacific Coal & Oil Company's State 8-A, near C SW SE 21-23s-36e, Lynn field, developed water after starting off with a natural flow of 50 barrels hourly at 3646 feet or 217 feet sub-sea. The hole has been plugged back for completion. An exceptionally large volume of gas is present in the upper lime in this area.

Michigan

Watch promising Barry County wildcat

Mt. Pleasant, Mich.—N. A. Trexler's Bagley 1, NE NW SW 27-2n-9w, Hope Township, Barry County, swabbed 31 barrels net after a 500 gallon acid treatment. To be placed on the pump for additional testing, the wildcat appeared to have about a 50-50 chance to make a small pumper and rate the first well for Barry County and the state's first 1940 discovery. Bagley 1 topped Traverse at 1867 feet and had about six inches of saturated lime at 1869 feet. It was bottomed at 1942 feet and filled up 1250 feet with oil after standing idle for 10 days.

Twenty-five completions were registered during the week of which 10 were wildcats—the latter all dry. D. E. Hughes junked the Bontekos 1, Section 11-20n-7w, Osceola County, at 4068 feet after drilling light oil saturation at 4021 feet in the Dundee. H. C. Nelson junked the Kittridge 1, Section 2-12n-18w, Muskegon County, which carried about 100 feet of oil in the Traverse at 1960 feet. Later it was deepened to 2059 feet, into the Dundee, and abandoned.

Wicklund Development Company's Leosh 1, Section 8-16n-3w, Wise Township, Isabella County, was estimated a 20-barrel pumper in the Dundee and may respond better after apparent bottom-hole cavings are cleaned out. Test is about ½ mile north of previously drilled Dundee production in the field.

Whether Wicklund Development Company will go ahead with original plans for a Sylvania sand test, between 4800 and 5000 feet, on the State 1, Section 11-18n-1w, Gladwin County, was doubtful this week. Test has been shut down for 15 days at 4696 feet with open hole from 3865 feet. It now carries a hole full of water. Officials said deeper drilling depended on contributing companies in the Buckeye field.

Rocky Mountain States

Montana's largest gasser is completed at Cut Bank

Casper, Wyo.—Flowing 80 million cubic feet initial, Glacier Production Company's Rigney 2, CSE SW SE 35-36n-5w, Cut Bank field, Glacier County, completed last week for the largest gas well in Montana. Three miles west of the Cut Bank gas field, and on the northeast edge of the Cut Bank oil field, it developed the gas production in the Moulton sand at 2905-2959 feet with hole bottomed at 2970 feet on top of the Cut Bank sand.

The large gasser has been hooked-in to Montana Power Company's line from Cut Bank to Butte, Helena, and Anconda. The well is offset on the north, south, and southeast by oil wells, which are producing from the Cut Bank sands, none of them spectacular completions. Development of gas in the sand above the normal Cut Bank producing horizon is expected to stimulate drilling in the northeast sector of the Cut Bank field.

North extension of the LaBarge field, Sublette County, Wyoming, is anticipated in North LaBarge Oil Company's (Joe Minton et al) Government 1, SWc NE SE 8-27n-113w, which is drilling and carrying 10-inch casing at 1335 feet. Objective sands in the Wasatch formation are expected at 1600 feet. A southeast offset, Government 2, SE SW SE 8-27n-113w, completed just prior to December 31 for 150,000 cubic feet of gas daily at 400 feet to validate federal permit. The gas is being used for fuel in drilling the deeper test, Government 1.

Making only a nominal showing of from 200,000 to a million cubic feet daily, the California Company's Unit 1, CSW NE 14-31n-109w, Wyoming's deepest hole at 10,003 feet, failed to come up to expectations of around 10 million cubic feet daily, and will abandon.

On Wyoming Anticline, Lincoln County, and 11 miles west of the LaBarge field, Miller Robert Taylor has shut down State 1, NEc 36-25½n-115w, first test to the Permian-Pennsylvanian beds west of the Darby fault, at 1937 feet after partially rigging-up heavy cable tools to drill ahead.

In Daggett County, Utah, Mountain Fuel Supply Corporation shut down for the winter at Murphy 4, CSW SE SW 21-3n-24e, which showed 5,000,000 cubic feet of gas daily in the Dakota sand through drill stem. The 6⅝-inch casing has been cemented at 5643 feet. A flow of 17,000 cubic feet in the Frontier had been gauged.

Shawnee Exploration Company has moved in heavy cable tools for a test to the undrilled Shannon and Wall Creek formations in the Shawnee oil and gas field, Converse County, Wyoming. Robert A. Salisbury 1, SEc SW NE 27-32n-69w, is 2 miles north of the long co-axial fault running through the length of the Shawnee structure. Covered with an over-burden of White River beds lying uncomformably on the Cretaceous rocks, geology of the Shawnee structure has been difficult to work out. Several gas wells, and two oil wells, with depths ranging between 500 and 600 feet have been completed at Shawnee. South of the fault, Wyshawn Oil Company abandoned the second of its deep wells drilled in that area, Lindley 2, NE SW SW 35-32n-69w, at 2940 feet, after plugging back to test showings of oil and gas in the top of the Embar.

In the Cole Creek field, Natrona County, central Wyoming, General Petroleum Corporation's Unit 1-21-G, CNW NW NW 21-35n-77w, topped the Shannon sand at 4530 feet, and is drilling ahead at 4542 feet. The well, a quarter mile northwest of the discovery is checking slightly higher than the initial Cole Creek well.

The Ohio Oil Company got underway last week in an important Lance Creek test, Agnes Rohlff 6, SE NW NE 32-36n-65w, an outside location a quarter mile ahead of production.

Sinclair-Wyoming Oil Company's Government 4-E, CSE SW 29-26n-87w, deep well to the untested Tensleep sands in the West Ferris field, Carbon County, Wyoming, will shortly penetrate objective, as last week it was drilling the red beds at 2788 feet. The well had the Sundance formation at 2546-2650 feet. The West Ferris field produces gas only from the Frontiers sands, Dakota series, and Sundance.

California

San Joaquin Valley wildcat awaiting test

Los Angeles.—Union Oil Company's Bowerbank 1, Section 23-29-24, Kern County, east of Buttonwillow, had 5¾-inch cemented at 11,662 feet preparatory to testing 60 feet of sand below 11,905 feet. Successful completion of the wildcat would open a new pool on the floor of the San Joaquin Valley.

Two wildcats in the Jasmine area of Kern County were attracting attention. Amerada Petroleum Corporation's Core Hole H was below 1300 feet in Section 13-25-27, while Bolling Oil Company was preparing to start in Section 15-25-27. Tide Water Associated Oil Company is reported to have deferred drilling a projected deep test in the Strand pool of this county, and will start a routine operation instead.

Continental Oil Company announced location for Community 1, wildcat in Section 12-28-24, in the Shafter area of Kern County. It will be a deep test.

Union Oil Company started deepening KCL 54-11, Section 11-31-25, at Coles Levee. Old total depth is 9715 feet. Richfield Oil Corporation's KCL B-67-4 was completed for 250 barrels daily at 9909 feet.

Wood-Callahan Oil Company's Todd 2 was completed for 300 barrels daily at 7643 feet for the sixth producer in the West Montebello pool.

O. H. Booth Dies at Pampa Following Automobile Injuries

Funeral services for O. H. "Shorty" Booth were conducted last week in Pampa, Texas, at the First Methodist Church. Burial followed in Fairview Cemetery. Booth died in a Pampa hospital of injuries received when his car overturned north of Shamrock. Since 1933, he was associated with Reed Roller Bit Company and was representative in the Pampa territory at the time of his death. He came to the Panhandle in 1921 with Dunigan Tool & Supply Company, later to join Continental Supply Company in 1928.

O. H. BOOTH

Welcome...HOTEL PITTSBURGHER

★ ★ *Rates* ★ ★
SINGLES $3 TO $4 DOUBLES $4.50 TO $6

. . . Pittsburgh's Newest Hotel 400 rooms, all with radio at no extra cost, outside view & bath.

A KNOTT HOTEL ★ JOSEPH F. DUDDY, Manager

UNITED STATES WELL COMPLETIONS

Arkansas

Company, Well and Location	Init. Prod. Bbls.	Depth
Columbia County (Magnolia)—		
G. H. Vaughn et al, J. Jones 1, 22-17-20	480	7632
Phillips, Joiner 2, 22-17-20	600	7740

California

Company, Well and Location	Init. Prod. Bbls.	Depth
Los Angeles County (West Montebello)—		
Hathaway Co., Dore 3	675	7470
Kern Oil Co., Monterey 31	625	7740
J. H. Marion, Mar-Vena-Cowan 6	465	7625
Wood-Callahan, Todd 2	210	7643
Los Angeles County (Seal Beach)—		
Continental, Bixby 42	323	4365
Los Angeles County (Torrance)—		
C. C. M. O., Torrance 48	180	4903
Los Angeles County (Wilmington)—		
Edco Pet. Co., No. 1	190	3437
Gremac Oil Co., Gremac 3	300	5678
J. M. Jackson Exp. Co., Workman (LB) 2	157	3505
Union Pacific, UP (LB) 124	366	3513
Fresno County (Coalinga-Northeast Field)—		
Union, Cook 57-18B	172	8641
Fresno County (East Coalinga Eocene)—		
Standard, No. 31-19F	3925	7955
Texas Co., Exeter 4	1260	8170
Kern County (Kern River)—		
Dick & Dore, No. 15	4	511
Fresno County (Kettleman No. Dome)—		
Standard, No. 63-7Q	871	8010
Superior, Huffman 4	275	10,816
Kern County (Midway Sunset)—		
Quality Oil Co., Cypress 4	70	1945
Kern County (Rio Bravo)—		
Superior, Fink 2	3280	11,480
Kern County (Round Mountain)—		
D. G. Vedder, Bell 11	336	1672
Ventura County (Ventura Avenue)—		
Lloyd Corp. No. 3	1500	10,283
Shell, Taylor 105	187	7257
Kern County (Mt. Poso Area)—		
F. E. Borton, Assoc. Ashe 1	*	2941
Santa Barbara County (Goleta)—		
General, More 5	*	4905
Shell, Barrett 1, (San Marcos area)	*	1956

Colorado

Company, Well and Location	Init. Prod. Bbls.	Depth
Larimer County (Fort Collins)—		
Continental, Meyer 1, sw se sw 19-8n-68w	300	4683

Illinois

Company, Well and Location	Init. Prod. Bbls.	Depth
Bond County—		
Jarvis, Welker 9, 192½ ft w of c e½ w½	250	1563
Clark County—		
Sanders & Walton, Weaver 2, nw sw nw 24-14n-14w	*	298
Clay County—		
Pure, Kirney Thomas 1, se ne ne se 13-2n-7e	520	3046
Clinton County—		
Shell, Buehler 7, se ne nw nw 12-1n-1w	94	1363
Cascade, Adams 4, se ne se ne 13-3n-1w	30	1437
Fayette County—		
Gulf, Small 15, se sw ne 36-6n-2e	120	1620
Ohio, Swarm 8, nw ne se 36-6n-2e	172	1619
Jefferson County—		
Magnolia, Schulik 2, se nw sw 22-2s-1e	150	2182
Lawrence County—		
W. W. Willis, Prather 1, c nw se 18-4n-10w	¶6	1120
Marion County—		
Texas, Lankford 7, sw nw nw ne 4-1n-2e	224	1876
McBride, Fyke 4, nw sw sw se 5-1n-2e	1050	2244
Texas, Corbin 6, 128 ft w of nw sw nw 5-1n-2e	1827	1801
Gibson & Jennings, Phillips 2, sw se nw nw 7-1n-2e	380	1864
Texas, Bell 1, ne ne nw nw 7-1n-2e	105	1867
Magnolia, Chitwood 40, c s½ n½ sw 16-2n-2e	200	2100
Texas, Jett 25, 23 ft e of c se sw 16-2n-2e	105	2075
Jett 26, c s½ sw 16-2n-2e	210	2093
Jett 27, 30 ft e of ne se sw 16-2n-2e	217	2085
Magnolia, Chitwood 42, c w½ nw se 21-2n-2e	90	2095
Shanafelt 27, c s½ ne nw 21-2n-2e	150	2056
Texas, Young 18, 18 ft e c se nw 21-2n-2e	210	2090
Haynes & Thomas, Roadway 2, ne nw ne sw 28-2n-2e	*	2122
Magnolia, Young 72, sw se nw sw 28-2n-2e	140	2100
Texas, Stroup 10, sw ne ne nw 31-2n-2e	315	1830
City of Centralia 41, se of se c sw 33-2n-2e	217	1865
Kingwood & Bell, Shanafelt "A" 19, se sw nw ne 20-2n-2e	3192	3420
Shanafelt "A" 20, se se ne ne 20-2n-2e	3650	3446
Ladd Oil Co., Church 4, sw of sw c nw 21-2n-2e	2400	3457
Magnolia, Shanafelt 30, ne se nw se 29-2n-2e	2368	3408
Shell, Verner 2, 22 ft n of sw nw nw 18-3n-1e	110	1430
Ververs 3, 27 ft s of sw nw nw 18-3n-1e	160	1432
Ververs 5, nw sw sw nw 18-3n-1e	*	1443
Harvey, Kagay 9-A, sw nw se se 33-3n-2e	150	2040
Dunbar & Wingate, France 1, c ne nw sw 1-4n-4e	*	2692
Montgomery County—		
Carter, Cummings 3, sw ne ne 21-8n-3e	58	1593
Wright 10, ne sw ne 21-8n-3e	156	1586
Bennett 2, se sw nw 29-8n-3e	132	1482
Ireland 2, se se se 29-8n-3e	1120	1515
Jarvis Bros., Yakey 16, se ne sw se 6-7n-3w	125	1543
Minerva Oil Co., Sather 1, nw se sw 16-7n-3e	*	1600
Carter, Welker 4, ne ne nw 18-7n-3e	*	1573
Perry County—		
Cochran et al, Pyramid Coal Co. 1, ne nw se 35-5s-3w	*	1655
Randolph County—		
Alvin F. Fisher, Uchtman 1, sw sw ne nw 7-6s-5w	*	1641
Richland County—		
Pure, Wells 2, c se se ne 23-4n-9e	48	2624
Wabash County—		
Centralia Rfy., Van Ault 1, sw se ne 9-2s-13w	57	2456
J. C. Meyers, Lovellette 3, se nw se sw 9-2s-13w	170	2472
Pearson et al, Epler 1, sw ne ne sw 9-2s-13w	*	1509
J. R. Mitchell, Batson 1, w½ nw nw sw 16-2s-13w	158	2448
Continental, Cowling 2, c nw se sw 17-2s-13w	158	2484
Magnolia, Batson 3, sw ne se 17-2s-13w	100	2428
Tidewater, LeGier 5, 107 ft e of se se ne 17-2s-13w	100	2411
Spencer 2, se sw se 17-2s-13w	190	2479

Summary of Drilling Operations in the United States, Week Ended January 13, 1940

	WELLS COMPLETED							*NEW WELLS STARTED				
	Completions	Oil Wells	Gas Wells	Failures	Initial Production	Total 1940	Total this Date 1939	This Week	Total this Month	Total 1940	Total this Date 1939	Year Total 1939
Alabama	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Arizona	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Arkansas	2	2	.....	.....	1,080	13	17	.....	3	3	11	223
California	24	21	.....	3	15,371	74	54	19	51	51	52	1,136
Colorado	1	1	.....	.....	300	1	.....	.....	.....	.....	.....	.....
Florida	.....	.....	.....	.....	.....	.....	.....	1	1	1	.....	.....
Georgia	.....	.....	.....	.....	.....	.....	.....	1	1	1	.....	.....
Illinois*	77	51	1	25	22,600	205	137	77	202	202	*	893*
Indiana	8	5	.....	3	991	28	6	.....	.....	.....	.....	.....
Kansas	29	23	1	5	27,593	95	59	17	64	64	70	1,583
Kentucky	2	2	.....	.....	90	24	53	.....	.....	.....	.....	.....
Louisiana	22	19	.....	3	5,596	93	46	74	74	74	42	1,449
Michigan	25	13	1	11	3,445	88	50	13	82	82	43	1,419
Mississippi	3	3	.....	.....	1,783	8	.....	1	1	1	.....	.....
Montana	10	4	3	3	230	10	2	.....	.....	.....	.....	.....
Nebraska	.....	.....	.....	.....	.....	.....	.....	1	1	1	.....	.....
New Mexico*	16	11	.....	5	5,998	53	41	17	41	41	*	293*
New York	21†	21†	.....	.....	125	64†	9†	1	1	1	.....	.....
North Dakota	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Ohio	36†	14†	15	7	139	73†	41†	.....	.....	.....	.....	.....
Oklahoma	11	6	2	3	546	95	95	46	88	88	68	2,059
Pennsylvania	41†	34†	3	4	31	114†	70†	1	1	1	.....	.....
South Dakota	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tennessee	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Texas	230	180	6	44	91,671	582	487	261	563	563	252	10,269
Utah	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
West Virginia	25	4	14	7	46	43	28	.....	.....	.....	.....	.....
Wyoming	9	7	1	1	3,911	9	18	.....	.....	.....	.....	.....
Total this week	592	421	47	124	181,530	1,672	1,213	530	1,176	1,176	538	18,752
Total last week	540	396	30	114	166,489	1,080	808	124	603	603	244	18,752
Total this year	1,672	1,222	99	351	541,550	1,672	1,213	1,170	1,170	1,170	538	.....

* This tabulation includes those states where weekly data are available; figures for Illinois date from October 15, 1939; New Mexico from August 1, 1939.
† Includes water-input wells.

United States Well Completions—*Continued*

ILLINOIS—*Continued*

Company, Well and Location	Init. Prod. Bbls.	Depth
Halstead Oil Co., Gray 1, se ne nw sw 29-2s-13w	240	2482
Randall et al, Shultz 2, se nw se sw 31-2s-13w	•	2124
Jackson & Green, Garst 1, 140 ft n of se se ne 33-2s-13w	•	510
Blalock et al, Broster 1, sw sw nw se 34-2s-14w	•	2659
Broadus et al, Broester 2, nw sw sw se 34-2s-14w	105	2672
Herrick & Broadus, Broster 2, nw nw sw se 34-2s-14w	82	2652
Phillips, Shultz 9, nw of se c nw 7-3s-13w	•	2558
Washington County—		
Shell, Dix 1, sw se se 18-3s-1w	•	1661
Cochran, Kula 1, se se se 8-3s-2w	•	1566
G. G. Warr, Dennis 1, sw ne ne 14-3s-3w	8	1231
Shell, Holston 10, 15 ft w of sw nw ne 22-3s-3w	36	1306
Wayne County—		
Pure, Scrughan 2, 70 ft s of nw nw sw 19-2n-8e	75	3098
Hubble 1, c e½ se sw 33-2n-8e	52	3115
Texas, Clark 1, c e½ se se 4-2s-7e	324	3256
H. H. Weinert, Rumpf 1, c w½ sw nw 10-2s-7e	•	3290
Anderson, Stewart 1, e½ se nw 23-2s-8e	•	3404
Robinson et al, Caldwell 2, ne ne nw 34-2s-8e	300	3394
White County—		
Pyramid Oil Co., Porter 2, e½ sw se 12-6s-8e	•	3143
Exchange, Storms 7, ne se ne 14-6s-9e	•	2289
Blackstock, Storms 3, nw nw nw 24-6s-9e	•	3068
R. E. Johnson, Bennett 1, nw nw ne 24-6s-9e	•	3082
O'Meara & Wilson, Bennett 1, nw ne se nw 24-6s-9e	•	2045
Bennett, ne ne se nw 24-6s-9e	•	150
R. E. Johnson, Faught 1, nw se ne 26-6s-9e	•	80
W. R. Hayes, Orman 1, nw ne nw 18-6s-10e	•	3060

Indiana

Company, Well and Location	Init. Prod. Bbls.	Depth
Gibson County—		
Continental, Block 1, nw nw sw 13-3s-13w	•	2367
Keck 3, sw sw se 26-3s-14w	135	2517
Missener & Baldwin, New Harmony Bank 1, sw sw se nw 27-3s-14w	•	2901
Posey County—		
C. W. McKeehan, Keck 2, c n½ nw nw 35-3s-14w	216	2512
Superior, New Harmony 19, nw nw sw 10-5s-14w	300	2220
New Harmony 20, nw nw nw 15-5s-14w	40	2256
New Harmony 21, se sw ne 9-5s-14w	300	2205
Spencer County—		
Chas. E. Dice, Grass 3, se sw ne ne 11-6s-4w	•	855

Kansas

Company, Well and Location	Init. Prod. Bbls.	Depth
Barber County—		
Patton Drilling Co., Hoss 1, c w½ nw sw 12-30-15w	•	4760
Barton County—		
Gulf, Riemann 1, c s½ se se 33-16-11w	79	3397
Ohio, Kramer 1, swc se 9-16-13w (salt water disposal)		3545
Shell, Schneider "B" 11, cwl sw se nw 1-16-14w	2120	3294
Western Kansas O. & Refg. Co., Gage 2, csl sw ne nw 2-17-13w	•	3350
Stanolind, Thomas 4, c sw 35-19-11w	1160	3302
Stuckemann 14, se ne sw 11-20-11w	374	3292
Gulf, Spanier "B" 2, swc 12-20-11w	181	3284
Continental, Scheulfer 1, se nwc 24-20-12w	3000	3340
Butler County—		
Rex et al, Johnson 4, se ne se 20-26-7e	35	2777
Coffey County—		
Dunne, Rossillion 7, sw ne se se 12-23-14e	3	1553
Cowley County—		
Barnsdall et al, Sanford 1, sec sw 28-30-4e	•	3328
Western Kansas O&R Co., Ferguson 5, se ne sw 21-30-8e	35	2192
Ellis County—		
Cities Service, Colahan 6, cwl nw ne nw 24-11-17w	3000	3383
Central Petroleum Co., Hadley 1, c n½ nw se 12-11-18w	3000	3357
Trigg et al, Baker 1, c e½ nw ne 15-12-18w	•	3821
Ellsworth County—		
Duwe et al, Boye 1, c w½ sw sw 9-16-10w	3000	3372
Lyon County—		
Royer et al, Trear 1, nwc 20-21-12e	•	2006
Marion County—		
Younger, Martin 3, c s½ s½ 3-17-4e	90	2385
Pratt County—		
Skelly et al, Harding 1, c sw 7-28-11w	374	4283
Rice County—		
Continental, Johnson 4, sw se sw 12-18-8w	3000	3234
Shell, Reese 2, ne nw ne 22-19-9w	1171	3240
Skelly, Ira 2, c s½ se nw 27-19-10w	¶9.7	3110
Gulf, Drake 2, nwc sw 31-20-7w	2096	3328
Mid-Plains, Engelland 3, c n½ nw se 15-21-7w	291	3394
Russell County—		
Skelly, Opdycke 9, c n½ ne sw 29-14-13w	1156	2936
Cities Service, Mai "A" 4, cwl sw se sw 24-15-14w	2615	3335
Stafford County—		
Trigg et al, Mellies 1, csl sw nw sw 36-21-12w	423	3578
Continental, Keller 1, sw nec 22-24-13w	390	4115

Kentucky

Company, Well and Location	Init. Prod. Bbls.	Depth
Daviess County—		
Farmer, Brown 3	40	1376
Hancock County—		
Flescher, Sanders 3	50	473

North Louisiana

Company, Well and Location	Init. Prod. Bbls.	Depth
Bossier Parish (Sligo)—		
Triangle Drlg. Co., Herold A-5, 13-17-12	200	3012
Webster Parish (Cotton Valley)—		
H. L. Hunt, Stewart 4, 32-21n-10w	512	8648
Quad Oil Co., Gray 1, 27-21n-10w	264	5677
Stanolind, Pardee Co. 4, 25-21n-10w	348	8576

South Louisiana

Company, Well and Location	Init. Prod. Bbls.	Depth
Abbeville—		
Continental, Baudoin 2	•	7944
Caillou Island—		
Texas Co., State 9	292	5879
State 12	313	5912
Charenton—		
DeArman, Lawes 1	•	3007
Knisley, Hertel 10	198	1133
Pan American, Lawes 19	20	1163
Robichaux 15	30	1156
Eola—		
Amerada, Glaze 6	689	8570
Glaze 7	725	8570
Sid Richardson, Mizer 1	351	8572
Golden Meadows—		
Bershire Oil Co., Nicol 2	480	5180
Nicol 12	240	2680
Martex, Rebstock 2	168	5222
Iowa—		
Shell, Heyd 31	389	4469
New Iberia—		
Wm. Helis, Bolivar 11	42	877
South Jennings—		
Stanolind, Doherty 1	184	9518
Ville Platte—		
Continental, Vidrine 2	151	9106
Assumption Parish—		
Shell, Ells 1, Amelia prospect, 69-14s-16e	•	11,561

Mississippi

Company, Well and Location	Init. Prod. Bbls.	Depth
Yazoo County (Tinsley Dome)—		
E. C. Johnston, Brumfield 1, 2-10n-3w	800	4832
Jones & O'Brien, Stevens B-2, 12-10n-3w	408	6134
Union, G. C. Woodruff 4, 13-10n-3w	575	4801

Michigan

Company, Well and Location	Init. Prod. Bbls.	Depth
Allegan County—		
Lentz & Miller, Lida 3, se sw se 27-4n-14w	60	1561
Charley Cook, Kopper 2, nw sw ne 34-4n-14w	100	1452
Miller Bros., Schaap 1, nw ne sw 34-4n-14w	400	1434
Barry County—		
Transwestern, Tobias 1, nw nw nw 12-2n-9w	•	1905
Cass County—		
Gerristen, Beebe 1, se sw ne 5-8s-16w	•	596
MichiCal, Robinson 1, sw sw nw 16-5s-14w	•	1069
Clare County—		
Pure, Bicknell B14, c s se ne 28-19n-6w	100	3894
Gulf, State 2, ne se ne 29-19n-6w	900	3855
Isabella County—		
J. V. Wicklund, Leosh 1, se se sw 8-16n-3w	20	3738
Jackson County—		
A. G. Morency, Sturat 1, ne se nw 13-4s-2w	•	1550
Kalamazoo County—		
Smith Pet. Co., Kircher 1, se sw 21-2s-9w	•	1572
Kent County—		
American Dr. Co., Keeler 2, nw sw nw 29-7n-12w	75	1902
Wolverine, Kniff 2, sw nw se 29-7n-12w	800	1905
Gordon, Gypsum 3, sw se nw 34-7n-12w	•	1920
Walker Oil Co., Proudfit 1, sw sw nw 34-7n-12w	60	1841
McGerry, Gavin 1, nw nw nw 5-6n-12w	360	1903
Pyramid, Kingma 1, nw sw sw 3-6n-13w	20	1801
Montcalm County—		
Belvidere Oil Co., Fee 1, ne sw se 15-12n-6w	¶¼	1203
Muskegon County—		
H. C. Nelson, Kittridge 1, c e ne 2-12n-18w	•	2059
Ogemaw County—		
Weber Oil Co., Crawford 9, nw se ne 28-22n-2e	20	2730
Osceola County—		
D. E. Huge, Bontekos 1, ne ne 11-20n-7w	•	4068
Otsego County—		
L. W. Snow, Moore 1, ne ne ne 13-29n-2w	•	2510
Ottawa County—		
Mesel & Spielbergs, Harsevoorat 1, ne nw sw 20-6n-15w	•	1607
Smith Pet. Co., Heyboer 3, sw nw ne 25-7n-13w	550	1857
Van Buren County—		
Transwestern, Prindle 1, se se nw 34-3s-13w	•	1272

Montana

Company, Well and Location	Init. Prod. Bbls.	Depth
Glacier County (Cut Bank)—		
Glacier Production Co., Rigney 2, cse sw se 35-36n-5w	¶80	2970
Texas Co., Hessler 3, cse nw 20-33n-5w	50	3002
Government 3, cne sw 17-32n-5w	•	2990
Glacier Prod. Co., Minnette 1, cnw nw 34-33n-5w	30	2980
Texas Co., Lindquist 2, csw se 17-32n-5w	20	2886
Hill County (Box Elder)—		
Independent Natural Gas Co., Stranahan 4, cse sw 14-32n-17e	¶3	1289
Liberty County (Eagle Dome)—		
Coolidge & Coolidge, Forseth 1, cel se ne 8-35n-4e	•	1702
Toole County (Kevin-Sunburst)—		
B. A. S. Aronow, Ellingson 3, ne sw sw 14-35n-3w	200	1738
Prevol & Shea, Government 4, nw nw sw 11-35n-3w	•	1840

New Mexico

Company, Well and Location	Init. Prod. Bbls.	Depth
Eddy County—		
Berry et al, Berry 6, se sw sw 23-17s-27e	•	650
Brainard & Guy, Brainard 2, ne se nw 10-18s-29e	1680	2611
Cone et al, Saunders 1, sec nw 13-17s-27e	•	600
Dixon-Yates et al, Ballard 1-A, nw sw se 1-18s-29e	1200	2750

United States Well Completions—*Continued*

Company, Well and Location	Init. Prod. Bbls.	Depth
Fair et al, Brainard 3, nwc se 10-18s-29e	400	2602
Franklin Pet. Co., Masteller 1, nwc ne 7-18s-30e	*	2876
Flynn-Welch & Yates, Langford 1, nec nw 9-18s-29e	150	2494
Green Bay Oil Co.-Paton Bros., Erwin 2, c s½ se sw 9-18s-31e	350	3230
Me-Tex Supply Co. et al, Yates 3, c nw se 5-18s-29e	140	2619
Eddy County (Wildcat)—		
Culbertson & Irwin, Welch 1, c nw nw 19-20s-31e	*	2458
Lea County (Eunice)—		
Repollo, State 8-D-157, se sw sw 12-22s-36e	680	3785
Lea County (Langlie)—		
Weiner et al, Smith 4, nw se se 4-25s-37e	*	3506
Lea County (Lovington)—		
Amerada, State 6-L-A, c nw ne 1-17s-36e	280	4900
Lea County (Mattix)—		
Continental et al, Jack 7-B-27, c se se 27-24s-37e	244	3531
Lea County (Penrose)—		
Devonian, Christmas 3, nwc se 28-22s-37e	192	3675
Lea County (Vacuum)—		
Humble, State 13-K, c ne sw 28-17s-35e	672	4645
San Juan County (Kutz Canyon)—		
New Mexico O&G Co., Angels Peak 1, cnw sw 13-28n-11w	¶2	1955

New York

Allegany County—		
H. Sloan, Agt., Albert Oil Co., Bolivar	12	1260
Sawyer and Martin, Wasson, Bolivar	8	1370
MacDonell Oil Co., MacDonell, Bolivar	7	1279
Forest Oil Co., Ackerman, Bolivar	20	1428
M. J. Crowley, Coast et al, Bolivar	7	1272
Cretekos & Vossler, Norton, Scio	5	1070
Porge Oil Co., Anderson Oil Co., Alma	8	1252
L. H. Richardson et al, Scott, Alma	8	1555
L. & M. Oil Co., Maitland-Breckenridge, Alma	4	1324
O. D. Underwood et al, McDivitt, Bolivar	6	1265
L. H. Thornton et al, Brown, Alma	15	1358
Stout Cousin Oil Co., Brandes, Wellsville	5	1328
Hill, Hughes & Keller, fee, Genesee	4	1360
Messer Oil Co., Coon, Genesee	6	1380
Wilson Oil Co., Wales, Genesee	10	1375
Water (Intake) Wells		
Gray et al, Smith-Gray, Genesee	..	1420
Moore et al, Curtiss, Bolivar	..	1340
Forest Oil Co., Ackerman, Bolivar	..	1394
Bradley Prod. Corp., Monitor, Alma	..	1360
George Oil Co., Scott, Alma	..	1368
Summit Oil Co., Witter, Scio	..	1280

Ohio

Ashland County—		
Faulkner & Phelps, Mosher 3	¶	600
Athens County—		
Carpenter & Glazier, Smith 22	10	352
Smith 23	5	359
McBill Oil Co., Antle 6	2	407
A. J. Tolley, Morris 2	¶.40	520
Fairfield County—		
Gas Producing Co. of O., Berry 3	1	1990
Plum 3	6	1985
Guernsey County—		
Bindas et al, Guernsey Infirmary 1	6	470
Knox County—		
Upham Gas Co., Arnold 1	¶.90	2709
Licking County—		
W. H. Larrick, Frampton 1	25	2979
Ralston Oil Co., Frampton Hrs. 1	20	2979
Settles et al, Shannon Hrs. 2	5	688
Moore et al, H. B. Hughes 1	¶.79	2555
Dawler O&G Co., Deuselback 1	¶.50	2649
Bebout & Co., Flurshultz 1	¶.37	2696
J. L. Hunt, Nethers 1	*	2670
More & Murphy, Miller 1	*	2895
Lorain County—		
Dempsey et al, Sznes 2	¶1.50	2545
Medina County—		
Marine Trust Co., Ripley A-5	10	460
Curtis & Eaken, Huffman 1	7	592
Meigs County—		
B. & U. Gas Co., Might 1	*	715
Monroe County—		
Walker et al, Linswell 1	¶.90	2260
Pittman 2	¶.83	2253
Muskingum County—		
Gas Producing Co. of O., Sowers 7	*	4213
Noble County—		
E. Ward, Fee 1	40	690
Kennonsburg O&G Co., Ward 1	25	670
C. W. Rich et al, Williams Hrs. 1	¶.07	1538
T. L. Rich, Williams 1	¶.07	1523
J. L. Skinner, Brown 2	*	1697
Perry County—		
Atchinson & McVay, Simon 1	2	1170
Stark County—		
Dun-Mar O&G Co., Gill 1	¶1.25	4041
Tuscarawas County—		
Brendel Producing Co., Yackey 1	¶2.20	4513
Washington County—		
Campbell et al, Orniston 1	¶.47	1148
Porter et al, Male 1	¶.20	1415
H. E. Dixon et al, Whittington 1	*	1726
Wayne County—		
East Ohio G. Co., Baysinger 1	*	3689

Oklahoma

Creek County—		
Worley et al, Fee 3, nw sw se 34-14n-10e	*	3330
Hughes County—		
Rogers, Stand 1, se ne nw 23-6n-8e	17	2676
Magnolia, Warren 1, ne sw se 35-6n-8e	*	1264
Oklahoma County—		
I. T. I. O. Co., N. K. & T. "A" 5, swc 35-12n-3w (otd 6390 ft)	248	6407
Okmulgee County—		
Rebold, Hawkins 4, c sw ne 6-15n-13e	¶.7	880
Pontotoc County—		
Michaelson, Lord 1, nwc 3-1n-7e	10	1860
Skelly, Garret 1, nwc ne 3-1n-7e	¶2.8	1828
Delaney, Massey 1, se nw se 25-4n-6e	*	1801
Pottawatomie County—		
Amerada, Richardson 2, sw se sw 16-7n-4e (otd 4212 ft)	61	3580
Vernie, Lydick 1, sec ne 24-7n-4e (otd 4287 ft)	10	4344
Neville, Cowan 1, sec ne 35-10n-4e	200	4591

Pennsylvania

Bradford District		
H. E. Camp, Bing 263	2	....
Lloyd & Hardy, Meehan	3	....
George Van Vechten & Son, Farr	3	....
W. A. Bolles, Baum	1	....
Bug Oil Co., Yehl	¼	....
E. H. & H. H. Harter, fee	1	....
D. E. Quinlan Estate, fee	3	....
Forest Petroleum Corp., 2 wells	2	....
Bradford Transit Co., 12 wells	12	....
Bradford District (Water Intake Wells)		
Smith Newton Oil Co., Lincoln	..	....
Mix Creek Oil Co., fee	..	....
Forest Oil Corp.	..	....
Forest Petroleum Corp.	..	....
Niagara Oil Corp., 5 wells	..	....
Middle District		
J. W. Osenider, Strong Oil Co	½	....
S. Y. Ramage, Jr., Henderson	1	....
Middle District (Water Intake Wells)		
Crawford & Gregory Clapp Acc't., Crawford & Gregory	..	....
Butler-Armstrong District		
Pdeifer & Etthridge, Stokey	*	....
E. Boyer et al, Schnaufer heirs	¼	....
New York-Penn. Gas Field		
G. L. Cabot, Inc., Michael Moran	¶	....
New Penn Development Co., Rathbun & Donovan	*	....
Empire Producing Co., R. C. Holmes No. 1	*	....
Hanley & Bird, Glenn Vanderhoof	*	....
Cunningham Natural Gas Co., Maxwell No. 2	¶	....
Empire Producing Co., R. C. Holmes	¶	....

‡SOUTHWEST PENNSYLVANIA

Allegheny County—		
Heck & Larkin, Jeuther 1	10	....
F. P. Martin, Fee 1	5	1700
Price Bros., Kirk 1	¶.10	....
Cox & Gibson, Patterson 1	¶.09	2630
H. Nixon, Hickman 1	¶.04	2607
Gray et al, Alter 1	¶	3007
McKnight et al, Flick 1	*	1826
Armstrong County—		
Peoples Nat. Gas Co., Harkelroad 1	¶.26	3729
Dunmire 1	*	....
McCullough 1	¶.09	1180
T. W. Phillips G. & O. Co., Harkelroad 1	¶1.90	3426
H. C. Judson et al, Gray 2	¶.17	1536
Wray et al, Upperman 2	¶.11	1425
Myers 1	¶.09	3410
Mateer 1	*	1320
Shelocta O&G Co., Reefer 1	¶.08	3675
Louden & Shilling, Schaeffer 1	¶	3632
Pleasant Valley G. Co., Klingensmith 1	*	....
Broman & Dorcey, Martin 1	*	3710
Butler County—		
South Penn Oil Co., Fowler Hrs. 1	*	5549
Etheridge, Stokey 1	*	1502
Clarion County—		
M. T. Rhea et al, McKee 5	¶.37	948
T. W. Phillips G. & O. Co., Rankin 1	¶.32	....
Blair 2	‹¶	2962
Squirrel Hill G. Co., Sloan 2	¶.05	3016
Burnham Gas Co., Slater 1	¶.04	2849
Kimmel Gas Co., King 1	¶	....
Owens Illinois Glass, Bowersox 1	¶	....
Fayette County—		
Wahler-Powers O&G Co., Powers 2	¶.54	2264
Powers 1	¶.04	1353
Duquesne Gas Co., Demarke 2	¶.28	2477
Kirk 1	¶	2479
Greene County—		
M. Hendedson, Metz 4	50	3084
Northeastern G. Co., Fetty Hrs. 1	5	3244
Moore, Orrill et al, Rinehart 2	¶.26	1412
Herrod Run O&G Co., Dye 3	¶.24	2256
Brummage et al, Durr 1	¶.12	3245
N. Gas Co. of W. Va., Burns 1	¶.03	3161
Phillips et al, Sheppard 1	*	3182
Indiana County—		
T. W. Phillips O&G Co., Conner 1	¶.65	3119
Spence 1	¶.15	1641
Mack 1	¶.06	3621
Indiana Savings 1	¶.05	3414
Johnson 1	¶	3638
Diltz 1	¶	1419
Loman 1	¶	3281
Kent Mining 1	*	3462
Federal Land Bank 1	*	3575
Pool 1	*	3387
R. C. Galbreath Co., Steffrey 1	¶	....
Washington County—		
Union G. & O. Corp., Conn 822	6	1001
Conn 823	4	1043
Conn 826	4	1085
Williams & Co., Buchanan 4	6	979
Wherry et al, Weir Hrs. 1	¶2.40	1577
Shivers et al, Horne 1	¶1.30	1874
Foley & Williams, Clark 2	¶.20	1397
W. L. Potts, Kinnemond 1	¶.15	3090
McCloy et al, Clark 1	¶	....
A. V. Lewis et al, Wilson 13	*	1618
Westmoreland County—		
Peoples Nat. G. Co., Miller 1	¶	....
Blose 1	¶	3909
Dome Gas Co., Weister 1	*	4000

‡Group of late 1939 completions, details of which have been delayed in publication.

Texas Panhandle

Carson County—		
Texas Co., Boney-Magnolia 14	430	3110
Gray County—		
Magnolia, J. Haggard 15	222	3300
J. J. Wall 4	416	3288
Hutchinson County—		
Stanolind, Pitcher 13-A-a	276	3171
Terry 23	140	3029
Terry 24	262	3012
Ware 15-A	199	3175
Ware 16-A	233	3153
Watkins 22-A	257	3015
Texas Co., Garner 9-A	554	3050
Wheeler County—		
Christie-Hickman Drl. Co., Perkins 3	221	2475

West Central Texas

Brown County—		
McDonald-Campbell et al, Hill 3	10	1320
McCallum & Forbes, Williams 1	*	590
Callahan County—		
Farris et al, Williams 1, sec 2046	*	652
Hutton et al, Slaughter 1, sec 66	16	368
E. Johnson et al, Hatchett 1, sec 30	*	452
Coryell County (Wilcat)—		
Henderson et al, Davidson 1	*	800
Eastland County—		
Hickok Prod. & Dev. Co., Cleveland 5, sec 477	9	3876
Jones County—		
Fain-McGaha Oil Corp., Daughtry 8	168	1931
Lewis 7	145	1936
King Oil Co., Carter 9	556	1927
Wichita Prod. Co., Daughtry 4	325	1888
Shackelford County—		
Fortson & Taylor, McCown 2	1210	3192
Georgian Corp., Blach 10, sec 508	20	601
Hedrick & Moran Drl Co., Dawson-Conway 1	*	1581
Stephens County—		
Horwitz & Oldom, Hawley 1	1003	3600
Taylor County—		
Bradford & Robertson, Reeves 3	*	1843
Tal-Vez Oil Co., B. E. Plowman 1	¶4/10	2335
Taylor County (Wildcats)—		
Evans et al, D. M. Gist 1	*	1733
Fox & Dunn, O. D. McIlroy 1	*	1950
Snoddy & Lee, Antilley 1	*	2004

*Failures; †Junked; ¶Million cu. ft. gas.

United States Well Completions—*Continued*

West Texas

Company, Well and Location	Init. Prod. Bbls.	Depth
Andrews County (Emma)—		
Sinclair Prairie, University 1-69	828	4320
Andrews County (Means)—		
Humble, R. M. Means 23	1851	4522
Crane County (Gulf-McElroy)—		
Gulf, J. T. McElroy 206	1297	2885
Crane County (McCamey)—		
Texas Consolidated, Hughes-Texaco 9	392	2137
Crockett County (World-Powell)—		
Black et al, Powell 6-B	627	2632
Powell 7-B, sec 62	825	2618
Crockett County (Wildcat)—		
Commercial O&G Synd., O. W. Parker 1	*	2382
Ector County (Foster)—		
Arkansas Fuel Oil Co., Johnson 4-C	445	4209
Atlantic, Henderson 5	1670	4200
M. B. K. Drl. Co. et al, Gist 3-A	1503	4335
J. M. Gist 1-C	1180	4311
Schermerhorn Oil Corp., Johnson-Amerada 5	717	4210
Stanolind, E. F. Cowden 40-A	681	4200
E. F. Cowden 42-A	612	4180
E. F. Cowden 43-A	910	4150
E. F. Cowden 36-B	633	4215
J. L. Johnson 13	266	4215
J. L. Johnson 15	374	4210
J. L. Johnson 16	396	4215
J. E. Witcher 23	978	4200
Ector County (Goldsmith)—		
Gulf, Goldsmith 241	924	4218
Ector County (Jordan)—		
Skelly-Atlantic, University 5-E	209	3680
Worsham et al, Connell 5	690	3605
Ector County (North Cowden)—		
Stanolind, Roberts 21	348	4505
Roberts 25	632	4470
Roberts 27	1683	4500
Ector County (Wildcat)—		
Richmand Drl. Co. et al, T. P. Land Trust-Amerada 1	*	4500
Gaines County (Semiole)—		
Humble-T. P. Coal & Oil Co., Hahn 1	686	5270
Gaines County (Wasson)—		
Amon Carter et al, Wasson 5-E	552	5024
Hockley County (Slaughter)—		
Stanolind, Slaughter 5-B	707	5020
Western States Gasoline Corp., Mallet 1	370	5055
Howard County—		
F-H-E Oil Co. et al, Snyder 3	197	2848
Royal O&G Corp., Roberts 19	780	2952
Shasta Oil Co., Texas Land & Mtg. Co. 12	1064	2817
Sinclair Prairie, Dodge 64-a	285	2790
Nolan County (Wildcat)—		
Plymouth Oil Co., McClure 1	*	7453
Pecos County (Lehn)—		
Rockdale Oil Co., Sullivan 3	146	1720
Pecos County (Pecos Valley)—		
Superior Oil Corp., Iowa Realty 8	107	1644
Pecos County (Shearer)—		
W. H. Street et al, Fromme 3	344	1479
Pecos County (Taylor-Link)—		
H. G. Eastham et al, University-Standard 1-A	126	1692
Upton County (McCamey)—		
Cardinal Oil Co., Wooley-Shell 20	239	2165
T. P. Coal & Oil Co., Lane 42-A	298	2012
Ward County—		
Gulf, E. W. Estes 127	3776	2690
Hutchings 133	1855	2748
G. W. O'Brien 122	132	2847
Western Well Service Corp., Lackland 5	47	2089
Lackland 7	22	2085
Winkler County (Emperor)—		
Stanolind, E. W. Cowden 6	107	3070
Winkler County (Hendrick)—		
Bates-Reading Oil Corp., Cowden-Shell 3-C	282	2990
Yoakum County (Wasson)—		
Aloco Oil Co., Hovencamp-Texaco 4-a	1993	5090
Jordan-Saltmount 4	691	5200
Keller-Texaco 3	357	5150
Miller-Texaco 5-B	918	5165
Morris-Texaco 1	111	5235
Argo Oil Corp., Comer 4-A	865	5207
Eastland Oil Co., Chandler-Skelly 4	618	5255
Helmerich-Payne & Continental, Dowell 3-A	569	5105
Honolulu Oil Corp., Willard 1-761	1071	5195
Humble, Ed. Randall 6	756	5110
Mabee O&G Co., Willard 14	1212	5200
Magnolia, Mahoney 5	1177	5196
Mid-Continent Pet. Corp., Comer 3	1259	5170
Osage Drl. Co., Claywater-Amerada 2	1144	5235
Claywater-Amerada 3	1105	5230
Shell, Baumgart 4-B	845	5187
Baumgart 4-D	712	5169
F. W. Hensley 4	254	5280
W. S. Hodges 5	324	5230
Dora Roberts 9	607	5243
Siosi Oil Corp., Bennett 2	276	5274
Skelly, Kendrick 2	1275	5150
Tidewater Associated, Kendrick 2-A	933	5110

South Texas

SAN ANTONIO DISTRICT

Company, Well and Location	Init. Prod. Bbls.	Depth
Bastrop County—		
Marts & Beaven, Ferguson 1 (WC), 5¾ mi se Cedar Creek	*	2175
Caldwell County—		
Boomer, Camp 1 (WC), 5 mi n Lockhart	*	1880
Monk, Williams 1 (WC), 2 mi e Salt Flats	*	3015
Texas, Merriweather 11 (Salt Flats)	125	2495
Guadalupe County—		
Cities Service, Knoblock 4 (Darst Creek)	107	2552
Medina County—		
Medina, Schmidt 9 (Ina)	*	984
Milam County—		
Lawrence, Bartek 1 (WC), 3 mi e Buckholts	*	1653
Williamson County—		
Caffey, Shaw 1 (WC), survey No. 6 Cartwright (Byersville)	*	990

CORPUS CHRISTI DISTRICT

Company, Well and Location	Init. Prod. Bbls.	Depth
Bee County—		
Humble, Ruckman 1 (WC), 7 mi nw of Pettus	*	2808
Texas Gulf, Culpepper 1 (WC), 2 mi w of Beeville	*	5520
Brooks County—		
Humble, McGill 41 (Kelsey)	500	4735
McGill 42 (Kelsey)	500	4737
Jackson County—		
Crouch, Brewer 1 (Vanderbilt)	1650	5772
Humble, Kubecka 9 (Cordelle)	*	lcn.
Kubecka 10 (Cordelle)	*	lcn.
Magnolia, West 38-A (West Vanderbilt)	750	5125
West 39-A (West-Vanderbilt)	750	5135
Jim Wells County—		
Kilgore, Mosser A-6 (Reynolds)	525	5261
Magnolia, Elizondo 1 (Ben Bolt)	900	5501
Hornsby 1 (La Gloria)	100	7227
Myers & Simons, Reynolds & Richardson 2 (Magnolia City)	650	5708
Live Oak County—		
Coquat & Holland, Bonham 7 (White Creek)	86	1447
Simmons, McGriff B-12, (Oakville)	155	1836
Nueces County—		
Shield, Mienholdt 1 (WC) 1 mi n Robstown	*	6005
Windsor, Howze 1 (Minnie Bock)	250	3818
San Patricio County—		
Abbott & Traxler, Harris 2 (McCampbell)	375	7527
Bryant & Saner, Cummings 1 (McCampbell)	250	7500
Commercial, Dunn 2, East White Point	650	5622
Houston, Baldwin 6 (East White Point)	600	5683
Killam, Taft 6 (East White Point)	500	5611
Plymouth, Welder 114-C (Plymouth)	57	6660
Welder 116-C (Plymouth)	600	5654
Sun, Rossen 6 (Plymouth)	600	5642
Texas Atlas, Brown 1-13 (McCampbell)	225	7351
Welch, Fee 7 (East White Point)	550	5680
Victoria County—		
Barnsdall, Keeran 1-A (WC), (North Keeran)	75	7508
Gulf, Traylor B-25 (Heyser)	450	5497
Traylor B-28 (Heyser)	750	5479
Stanolind, Vandenberg and Hill 9 (East Placedo)	50	6373
Trinity, Moeller 1 (WC) (Victoria)	28	2555

LAREDO DISTRICT

Company, Well and Location	Init. Prod. Bbls.	Depth
Duval County—		
Duval, Hoffman 6 (Hoffman)	99	2875
Hiawatha, Southland 22 (North Sweden)	*	6005
Magnolia, Duval Ranch 1 (132), (Cedro Hill)	¶5	1484
Duval Ranch 18 (189), (Cedro Hill)	*	1635
Miller, Fee 18 (Longhorn)	500	4070
Texas, Duval Ranch 36 (589)	*	1703
Duval Ranch 37 (589)	*	lcn.
Jim Hogg County—		
Colorado, Trevino B-2 (Colorado)	500	3070
Humble, Atwood 7 (Colorado)	400	3069
McMullen County—		
Cities Service, Lowe Ranch B-2 (WC), 8 mi ne Munson	*	1612
Graham, Nueces Land 13 (Munson)	50	1223
Nueces Land 14 (Munson)	*	1223
Indian, Lark 1 (Jacobs)	*	906
Starr County—		
Bishop and Moss, Ricaby 6 (Ricaby)	112	1452
Davis, Slick 6-B (Rincon)	122	4866
Slick 7-B (Rincon)	750	4827
Magnolia, Yzaguirre 2 (WC), 6 mi nw Sun	*	6814
Sun, Speer 5 (Sun)	350	4991
Webb County—		
Arkansas, Adami A-4 (Adami)	75	995
Magnolia, Volpe-Benavides 17 (Volpe)	264	2463
Volpe-Benavides 18 (Volpe)	332	2465
Zapata County—		
Dulup, Trevino C-7 (Escobas)	*	770
Trevino C-8 (Escobas)	*	lcn.
Interstate, Lopez 8-C (Mirando Valley)	148	1777
Lopez 1-C (Mirando Valley)	157	1772

North Texas

Company, Well and Location	Init. Prod. Bbls.	Depth
Archer County (Hull-Silk)—		
Chapman-McFarlin, Wilson 6-C, sec 29	660	4383
B. M. Hester & Son, Finley 2	856	4308
Lipscomb et al, Wilson-McCrory 2 (pb to 3840 ft)	1240	4407
Archer County—		
Bowen et al, Portwood 1-C, sec 2411	*	1449
W. B. Hamilton Pet. Co., Ikard 2-C	15	1167
Southern Pet. Explo., Inc., Johnson 5	10	1301
Baylor County (Seymour)—		
British-American O. P. Co., Seals 1, sec 215	129	2602
Clay County—		
Clark, Tr., Shumake 12, blk 4	144	1191
Duncan-Arnhold et al, Duncan 16, blk 14	*	1227
Gannaway et al, Stephenson 6	3	235
Clay County (Wildcat)—		
Norwood et al, Myers-Texaco 1	*	1330
Jack County—		
Bennett Pet. Co., Cantrell 1	1152	3117
Champlin & Bass, Gahagan 2-A	1149	3240
Worsham et al, Cash 4	1315	3281
Sewell & Smith, Edwards 2	25	335
Edwards 3	10	337
Edwards 4	10	330
Edwards 5	10	325
Montague County—		
Falls Ref. Co., Bouldin 12	10	797
Wichita County (K-M-A)—		
Omohundro et al, Jones 2	784	4073
O. M. Jones 3	1024	4039
Wichita County—		
Houston et al, Noble Gray 11	*	260
Ross et al, Mitchell 27	11	1562
Mitchell 28, lot 5	10	302
Schram et al, J. H. Meyer 1	*	1235
Simon et al, Hardesty-Thomas 1	*	400
Wilbarger County (Consolidated)—		
Waggoner Ref. Co., Waggoner Est. 2-GG	424	3793
Wilbarger County—		
Consolidated Oil Co. et al, Waggoner Est. 2-EE	*	1847
King Oil Co. et al, Castleberry 8	50	2190
Wilbarger County (Wildcat)—		
King Oil Co., Waggoner Est. 1-U sec 5	*	4622
Young County—		
Butler et al, Bailey 1, sec 26	*	810
Cable Oil Co., Prideaux 6	2	578
McDonald et al, Larrimore 2, sec 253	6	670
Panhandle-Rankin, Taylor 2	425	2802
Zweifel et al, Vaughn 2-B	†	3864
Young County (Wildcat)—		
Craig et al, J. R. Castleman 1, sec 80	*	1243

Texas Gulf Coast

Company, Well and Location	Init. Prod. Bbls.	Depth
Anahuac—		
Humble, Middleton 47	665	7080
Tyrell 29	600	7085
Anchor—		
Humble, Mettler 1	474	10494
Boling—		
M. K. Culver, Floyd 23	15	323
Clear Lake—		
Humble, Humble-West Fee C-33	513	5913
Clinton—		
Houston Oil Co., Oates 1	¶15	3216
Fairbanks—		
Amerada-Stanolind, Foley 15	137	6844
Foley 16	115	6848
H. B. Ownby, White 9	167	6852
Friendswood—		
Humble, Moore 2	552	6051
Hastings—		
Stanolind, Wooster 9	581	5658
Humble—		
Texas Co. C. O. & G. 34	297	2978
Wilson Oil Co., Brown 3	123	1774
League City—		
Phillips, Lobit 6	219	8956
Lochridge—		
Shell, Ramsey B-7	233	6387
Pierce Junction—		
Rio Bravo, Settegast A-35	184	4027
Segno—		
J. K. Dorrance, Wing 6-A	479	8162
South Cotton Lake—		
Humble, Lawrence C-2	366	6515
Thompson—		
J. H. Blaffer, Davis 11-Y	480	4354
Humble, Davis 19	514	5410
Tomball—		
Humble, Fee-Anderson 2	310	5564
Withers—		
Texas Co., Pierce Estate B-44	57	5543
Harris County—		
Gulf, Roberts 1, Cypress, A, Roberts sur	*	7583

*Failures; †Junked; ¶Million cu. ft. gas.

United States Well Completions—*Continued*

East Texas

Company, Well and Location	Init. Prod. Bbls.	Depth
Joiner Area—		
Fisher et al, I. O. O. F. & J. T. Gray 1 (1/10-ac)	720	3775
Anderson County (Long Lake)—		
Tidewater-Seaboard, Shaw-Cern 13	¶115	5284
Anderson County (Wildcat)—		
J. C. Cook et al, Royal-Davey 1	*	1950
Houston County (Grapeland)—		
Lone Star & Trinity Gas Corp., Bean-Sun 1	¶82	6068
C. W. Smith-Sun 1	¶73	6030
Navarro County (Wildcats)—		
J. R. Bunn Drl. Co.-Willis, Stroeder 1	*	3251
Topaz Oil Co., Haynes 1	*	3450

West Virginia

Company, Well and Location	Init. Prod. Bbls.	Depth
Braxton County—		
Pittsburgh & W. Va. G. Co., Fisher 2465	*	2465
Cabel County—		
Kingery et al, Roberts 1	¶.74	3107
United Fuel Gas Co., Harless 4862	¶.21	3223
W. Va. G. Corp., Triplet 1	¶.16	3535
Ross 1	¶.11	3236
Calhoun County—		
McIntosh & Grimm, Marshall et al 1	25	1815
Clay County—		
Virginian G&O Corp., Swann et al 50	15	1915
Gilmer County—		
Pittsburgh & W. Va. Gas Co., South Penn 7701	¶.55	1920
Kanawha County—		
Godfrey L. Cabot, Jones et al 1	¶2.99	4938
Logan County—		
South Penn. Oil Co., Yawkey-Freeman 57	¶.52	2931
Pleasants County—		
E. C. Wilson, Cox 1	1	2042
Ritchie County—		
W. R. Hays, Eddy 1	¶.07	2107
Mossor & Son, Wright 1	*	2510
Burge Dr. Co., Warner 2	*	2456
W. A. Bickerstaff, Britton 1	*	1911
Roane County—		
Wolfcamp O&G Co., Westfall 1	¶1.00	1483
Upshur County—		
Cumberland & Allegheny, Phillips 295	¶.04	4313
Wayne County—		
Industrial Gas Co., MacMasters 1	¶.09	2880
Southern W. Va. G. Corp., Fraley 8	¶.06	3033
Skidmore et al, Morrison 1	¶.05	3782
Wetzel County—		
Hope Nat. G. Co., Blatt 7913	5	2840
Shafer 7914	¶.95	2198
Wirt County—		
G. W. Roberts, McConaughey 1-61A	*	2900
McConaughey 1-51A	*	2118
Wood County—		
C. E. Love, Chichester 1	*	1562

Wyoming

Company, Well and Location	Init. Prod. Bbls.	Depth
Carbon County (Horne)—		
Martin & Gaylord, Horne 1, cnl nw sw 22-22n-78w (Rock Creek)	¶7	1200
Ohio Oil Co., University 1, sw sw sw 16-19n-78w	24	3479
Niobrara County (Lance Creek)—		
Continental, Deilman 6-A, cnw ne ne 7-35n-65w	1764	5235
Deilman 5-B, nw se ne 7-35n-65w	1200	5353
Minnelusa Oil Corp., Mackinnie-Thompson 7, cse nw ne 7-35n-65w	840	5300
Sublette County (LaBarge)—		
Texas Co., State 2-E, sw nw 27-27n-113w	60	935
Weston County (Osage)—		
Osage Trust, McCullough 5, sw se nw 13-46n-64w	*	1360
Hugh Updike, Fee 4, cel ne ne 36-46n-64w	20	1561
Wheedon Oil Co., Government 22, csw sw 16-46n-63w	3	215

Want ten-acre spacing for Tarancahuas, Duval County

Operators in the new Tarancahuas field, Duval County, requested 10-acre spacing at a hearing before the Texas Railroad Commission last week. Cox and Hamon applied for the hearing. The operators also asked for a rule providing for 20 feet of surface casing and an allowable of 100 barrels per well daily.

Harvey Whitaker, geologist and owner of acreage in the field, said that production in the Gorman 1, discovery well, was found in the basal Frio at 2015 feet. The well was tested to 2039 feet and no water was encountered. He said the sand was approximately 60 feet thick, and estimated the water level at 2042 feet. Normal bottom hole pressure of 770 pounds was encountered.

Sun Oil Company agreed to purchase the full allowable, if granted by the commission.

Arkansas permits

Two drilling permits were issued last week by the Arkansas Oil and Gas Commission, as follows: Columbia County—Shell Oil Company, D. H. Lewis 2, C SE NE 19-17-19; and Hassie Hunt, H. A. McWilliams 2, C NE NE 16-18-19.

Stop "whip" in open hole

Use of Patterson-Ballagh Stabilizers reduces sticking of drill pipe by keeping the walls of the hole from caving. "Whip" is greatly reduced. The increasing high speeds of drill pipe necessitate use of these protective units. Made of the world's toughest rubber. See Composite Catalog.

Patterson-Ballagh

OPEN HOLE STABILIZERS

PATTERSON-BALLAGH CORPORATION

General Offices and Plant: 1900 E. 65th St., Los Angeles, Calif.
Mid-Continent Office: 1506 Maury St., Houston, Texas
New York City Office: 39 Cortlandt St.

Yep . . . you sure can cut your wrench expense with this Guaranteed RIDGID
UNCONDITIONAL GUARANTEE
If this Housing ever Breaks or Distorts we will replace it Free.
THE RIDGE TOOL CO. ELYRIA, O.

MILLIONS of users have learned how that housing guarantee adds to the life of a wrench, keeps it at work, stops time-out for repairs, cuts your investment in spare parts. You get the same expense-saving with this modern all-alloy wrench, with replaceable safe chrome-molybdenum jaws that grip and let-go instantly. You actually enjoy the adjusting nut that spins easily in all sizes, 6" to 60"—and the comfort-grip I-beam handle. And mind you, it costs no more than other top grade wrenches it far outworks. Save money—buy RIDGIDs at your Supply House . . . *today!*

THE RIDGE TOOL CO. • ELYRIA, OHIO

RIDGID PIPE TOOLS

WILDCAT REPORT
New Starts and Completions

CALIFORNIA
FIRST REPORTS

Kern County—Bolling Oil Co.'s No. 1, se 15-25-27, Jasmine area, lcn.

San Luis Obispo County—Gilmore Oil Co.'s Huasna Community 1, ne se ne 11-32-14, Huasna area, lcn.

GEORGIA
FIRST REPORTS

Clinch County — Georgia Resources, Inc., Gillican 1, Land Lot 200, District 12, spudded 12-in csg 325 ft, dr 400 ft.

ILLINOIS
FIRST REPORTS

Brown County—B. F. Kagy's Ripley 1, ne nw se 33-1n-2w, dr.

Clark County—J. W. Stipe, Jr.'s Troughton 1, ne sw ne 20-11n-14w, loc. Allen & Sherritt's Biggs 1, nw nw sw 9-11n-14w, loc.

Crawford County—Denver Producing & Refining Co.'s Dennis 1, nw nw nw 14-7n-14w, dr.

Edwards County—Massac et al's Toop 1, c e½ ne se 13-3s-10e, rig.

Lawrence County—H. Kay's Griggs 1, 200 ft from west line and 400 ft from south line, se 12-3n-13w, rig.

Shelby County—Max Pray et al's Russell Estate 1, ne ne nw 18-10n-6e, dr.

White County — New Penn Development Co.'s Williams 1, 165 ft from south line and 530 ft from east line, nw 28-3s-9e, loc.

COMPLETIONS

Coles County—L. Trulock et al's Trulock 1, se se ne 7-12n-14w, Ashmore tnp, top Ste. Genevieve 490 ft, abnd 603 ft.

Edgar County—Sanders & Walton's Weaver 2, nw sw nw 24-14n-14w, Embarrass tnp, abnd 298 ft.

Effingham County — Kingwood Oil Co.'s Reichheim 1, ne ne ne 21-6n-6e, Union tnp, plugged back to 2895 ft after drilling to 2956 ft, shot and acidized, swabbed water, abnd.

Peoria County — Algona Oil Co.'s Chas. Cramer 1, se se sw 27-8n-5e, Trivola tnp, top Devonian 784 ft, top Silurian 857 ft, top Plattin 1186 ft, top Glenwood 1480 ft, abnd 1560 ft.

Perry County — Cochran et al's Pyramid Coal Co. 1, ne nw se 35-5s-3w, Pinckneyville tnp, top Fredonia 1613 ft, abnd 1655 ft.

Randolph County—Alvin F. Fisher's Uchtman 1, sw ne nw 7-6s-5w, Steelville tnp, top St. Louis 1185 ft, abnd 1650 ft.

Wayne County—Anderson's E. C. Stewart 1, nw ne nw 23-2s-8e, Grover tnp, top McCloskey 3379 ft, abnd 3405 ft.

White County—R. E. Johnston's Faught 1, nw se ne 26-6s-9e, Heralds Prairie tnp, abnd loc. Exchange Oil Co.'s Brumlet 1, se se sw 25-4s-10e, Phillips tnp, top St. Louis 3102 ft, abnd 3140 ft.

INDIANA
COMPLETIONS

Gibson County—J. E. Amis' Dunn 1, 50 ft n line and 100 ft w line, nw ne 19-3s-13w, abnd 2145 ft in Waltersburg sand. Shirley et al's McRoberts & Kell 1, 800 ft from north line and 150 ft from east line nw ne 7-1s-9w, abnd 1000 ft. W. F. Lacy's P. Julian 1, c ne nw se 26-3s-14w, deepened from 2525 ft, abnd 2986 ft.

Hancock County—J. M. Seip's Steel 1, ne nw ne 17-6n-6e, abnd loc.

Knox County—Wiggens et al's State Life Insurance Co. 1, sw sw nw 14-1s-12w, abnd 2402 ft.

Perry County—H. J. Baker et al's Peters 1, 50 ft from east line and 100 ft from south line, nw nw 11-5s-3w, top Barlow 410 ft, abnd 425 ft.

Pike County—Walker & Rogers' C. Colvin 1, 495 ft from north line and 660 ft from west line, nw ne 30-1n-6w, top Glen Dean 765 ft, abnd 795 ft.

Sullivan County—Siosi & Pardon's B. Cushman 1, ne ne se 18-8n-10w, abnd at 2825 ft with water in hole.

KANSAS
FIRST REPORTS

Marion County—Union Oil and Royalty Co., et al's Lucker 1, nwc 10-18-4e, lcn.

McPherson County—Hammer et al's Swenson Estate 1, csl sw ne 8-18-4w, pits.

COMPLETIONS

Barton County—Duwe et al's Meggers 1-A, cel sw 21-20-11w, w of S. Silica pool, top Lansing 3091 ft, top Arbuckle 3339 ft, abnd 3352 ft.

Ellsworth County—Bartlett et al's Janssen 1, sec 21-17-9w, 2 mi w Lorraine pool, top Arbuckle 3310 ft, abnd 3325 ft.

Rice County—Saco Oil Co.'s Habiger 1, sec sw 12-18-10w, Bredfeldt West pool, top Arbuckle 3249 ft, td 3268 ft, 373 bbls.

KENTUCKY
COMPLETIONS

Christian County—Dr. W. L. Wood's Fee 1, 3100 ft from north line and 1000 ft from west line, sec 5-E-24, abnd 711 ft.

Webster County—Chester Oil Co.'s A. B. Clark 1, 2900 ft from north line and 1700 ft from east line, sec 3-M-22, abnd 3128 ft.

NORTH LOUISIANA
FIRST REPORTS

Bossier Parish—J. K. Wadley et al, Norwood Vance 1, swc nw sw 4-19n-13w, rig.

SOUTH LOUISIANA
FIRST REPORTS

Ascension Parish—Falcon-Seaboard & Geo. Helis' A. Simmeaux 1, Napoleonville area, 1050 ft n, 200 ft w sec nw 43-12s-13e, lcn.

Beauregard Parish — Atlantic's Lutcher Moore 1, Pine Grove area, c se ne 13-12s-5w, lcn.

Calcasieu Parish—E. W. K. Andrau et al's Blackman 1, s of Iowa field, sw 20-9s-6w, lcn.

Lafourche Parish — Humble's Caldwell Sugars 1, North Thibodeaux area, 3035 ft sw along nw line of sec 115 from n corner and 200 ft se at right angles in sec 115-14s-15e, lcn.

MICHIGAN
FIRST REPORTS

Allegan County—Red-Man Oil Co.'s Hibma 1, nw sw ne 4-4n-12w, rig.

Missaukee County — Freeman Oil Co.'s School 1, se sw 36-22n-8w, dr.

COMPLETIONS

Barry County — Transwestern Oil Co.'s Tobias 1, nw nw nw 12-2n-9w, Traverse 1848 ft, abnd 1905 ft.

Cass County—Gerritsen & Williams' Beebe 1, se sw ne 5-8s-16w, Traverse 585 ft, abnd 596 ft. Michi-Cal Oil Co.'s Robinson 1, sw sw nw 16-5s-14w, Traverse 1016 ft, so 1017 ft, abnd 1069 ft.

Jackson County—Alfred Morency's Stuart 1, ne se nw 13-4s-2w, abnd 1550 ft.

Kalamazoo County—Smith Petroleum Co.'s Kircher 1, se sw 21-2s-9w, Traverse 1480 ft, abnd 1512 ft.

Muskegon County—H. C. Nelson's Kittridge 1, c ne 2-12n-18w, Traverse 1666 ft, Dundee 2040 ft, abnd 2059 ft.

Osceola County—D. E. Hughes' Bontekos 1, ne ne 11-20n-7w, Dundee 3919 ft, so 4021 ft, water 4060 ft, abnd 4068 ft.

Otsego County—L. W. Snow's Moore 1, ne ne ne 13-29n-2w, Traverse 1700 ft, sg 1865 ft, abnd 2510 ft.

Ottawa County—Mesel & Spielbergs' Harsevoorat 1, ne nw sw 20-6n-15w, Traverse 1600 ft, abn 1607 ft.

Van Buren County—Transwestern Oil Co.'s Prindle 1, se se nw 34-3s-13w, Traverse 1244 ft, abnd 1272 ft.

MISSISSIPPI
FIRST REPORTS

Lauderdale County—B. F. Melat, Tr., Lockard 1, sw sw 26-7n-15e, moving in.

MONTANA
COMPLETIONS

Liberty County — Coolidge & Coolidge's Forseth 1, cel se ne 8-35n-4e, abnd 1702 ft Granite.

NEBRASKA
FIRST REPORTS

Morril County—Bonner Cattle & Loan Co.'s Hall 1, se 10-23n-49w, Bonner area, dr 1500 ft.

NEW MEXICO
COMPLETION

Eddy County—Culbertson & Irwin, Inc.'s Welch 1, c nw nw 19-20s-31e, elev 3504 ft, trace gas 1166 ft, show air 1255-95 ft, abnd in salt water 2458 ft.

NEW YORK
FIRST REPORT

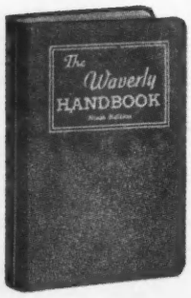
Steuben County—Belmont Quadrangle Drilling Co.'s Ashbaugh 1, Hartsville tnp, moving in material.

OKLAHOMA
FIRST REPORTS

Creek County—Bryan Petroleum Co.'s Ah-Say 1, ne nw ne 34-14n-7e, machine.

Lincoln County—Purcell et al's Wolcott 1,

Have You Ordered Your Copy Yet?



The 9th Edition of the Famous

WAVERLY HANDBOOK

More than 900 pages of important technical, engineering and chemical information pertaining to every phase of the Petroleum Industry. Written and compiled by leading Petroleum Engineers and technical authorities in the United States and Europe . . . **THE ONLY BOOK OF ITS KIND PUBLISHED TODAY!**

In addition to its value to oil men, engineers and chemists, The Waverly Handbook is an outstanding aid to Engineering and Petroleum students. It has been adopted as a textbook by many of the country's leading engineering schools, and is subscribed to and approved by many of the high-ranking laboratories of the world.

IT'S THE OIL MAN'S BIBLE—THE ONE BOOK YOU CANNOT AFFORD TO BE WITHOUT!

Regular Binding.....**$1.50**
DeLuxe Fabrikoid.....**2.00**

Gulf Publishing Co., P. O. Box 2811, Houston, Texas

nwc 2-13n-4e, rur. Conhaim's Teter 1, nwc sw 24-17n-2e, lcn.

Payne County — Gardner Petroleum Co.'s Wetzel 1, ne nw se 2-18n-1e, rur.

COMPLETION

Washita County — Continental Oil Co.'s Proctor 1, c nw 28-10n-20w, 7 mi se Elk City, top Pontotoc 4450 ft, top Pennsylvanian 6577 ft, td 14,582 ft, pb 11,135 ft, perforated up hole, puff of gas on drill-stem test, abnd.

PENNSYLVANIA

FIRST REPORT

Potter County—Hanley & Bird and New Penn Development Co.'s F. Osgood 1, Allegany tnp, moving in material.

EAST TEXAS

FIRST REPORT

Bowie County—W. E. Neill et al's Lewis Fort 1, 600 ft from n and 150 ft from e lines 103-ac tr, L. Peters sur, 2½ mi ne Hooks, dr 400 ft.

COMPLETIONS

Anderson County—J. C. Cook et al's Royal-Davey 1, 430 ft from w and 830 ft from n lines 107-ac tr, L. McCloud sur, 1 mi n Jarvis, elev 389 ft, abnd 1950 ft.

Navarro County—J. R. Bunn Drl. Co.-Willis' Alex Stroeder 1, 150 ft out of sec 74-acre tr, J. White sur No. 819, 3 mi se Navarro, elev 320 ft, abnd 3251 ft. Topaz Oil Co.'s R. C. Haynes 1, 1250 ft n and 60 degrees e of nec of 500-ac tr, but on 142½-ac lease, and 11,180 ft w of nwc of Parsons sur, but in J. W. Moore sur, 4 mi ne Bazette, elev 288 ft, Pecan chalk 1715-1868 ft, abnd in Woodbine water sand 3444-50 ft.

WEST TEXAS

FIRST REPORTS

Crockett County—M. & M. Drilling Co.'s Bouscaren 1, 2310 ft out of nwc corner of lease, HE&WT Ry. sec 29, lcn.

Ector County—M. A. Grisham et al's R. B. Cowden 1, c ne ne T&P sec 4, blk 45, T-1-N, lcn for 5700-ft test.

Howard County—M. L. Richards et al's J. A. Shaffer 1, se se se H&TC sec 32, blk 25, machine.

Mitchell County—N. V. Hilbun et al's E. T. Strain 1, se se se H&TC sec 82, blk 97, sp and sd.

COMPLETIONS

Crockett County—Commercial O&G Synd.'s O. W. Parker 1, 800 ft from n and 6850 ft from e lines I&GN sec 83, blk 1, elev 2224 ft, top anhydrite 266 ft, salt series 495-1165 ft, top lime 1862 ft, abnd in sul w 2380-82 ft.

Ector County—Richmond Drl. Co.-Rhodes & Tompkins' T. P. Land Trust-Amerada 1, sw sw se T&P sec 19, blk 42, T-1-S, elev 3032 ft, top anhydrite 1760 ft, top Yates frosted grains 2880 ft, top brown lime 3770 ft, top solid lime 4045 ft, abnd 4500 ft.

Nolan County—Plymouth Oil Co.'s F. McClure 1, sw ne nw T&P sec 49, blk 23, elev 2396 ft, base white lime 790 ft, base San Angelo lime 1350 ft, top Valera anhydrite shale 2950 ft, top Palo Pinto 5810 ft, top Ellenberger 6965 ft, top Cambrian sand 7435 ft, abnd in sand 7453 ft.

WEST CENTRAL TEXAS

FIRST REPORT

Eastland County—Butler-Horne Drl. Co.-E. J. Keough's L. Walters 1, c nw sw H&TC sec 83, blk 3, mim for 3350-ft test.

COMPLETIONS

Coryell County—Crews et al's Blanchard 1, lcn abnd. Henderson et al's Davidson 1, Neil Robinson sur, abnd 800 ft.

Taylor County—Joe Evans et al's D. M. Gist 1, 150 ft out of swc se nw B.A.L. sec 18, trace o&g 670-80 ft, top black shale 1692 ft, abnd 1733 ft. D. Fox & W. C. Dunn's O. D. McIlroy 1, 630 ft from s & 150 ft from e lines B.A.L. sec 15, abnd in w.s. 1945-50 ft. W. L. Snoddy-H. W. Lee's T. H. Antilley 1, 220 ft from n & 2200 ft from e lines s½ B.A.L. sec 55, abnd 2004 ft.

SOUTHWEST TEXAS

FIRST REPORTS

Bee County—Bunte Bros.' Earnest 2, 40-acre tract, sw corner 287.8-ac tract in Bee County School Land, Abst. 103, 14 miles sw West Tuleta, lcn. Hewitt & Dougherty and R. R. Ogden's Weiss 1, J. M. Uranga Grant, 6 mi se Pettus, lcn. Union Producing Co.'s Ray 56, Thomas Hanson sur, Abs. 172, 850 ft e No. 39, lcn.

DeWitt County—Howeth et al's Fuhrken 1-A, Antonio Lazo sur, 5½ mi s Nordheim, lcn for Yegua sand test.

Duval County—J. B. Blanchard's Ruiz Estate 1, se½ survey 136, 6½ mi sw Fitzsimmons field, moving in.

Hidalgo County—Gulf State Oil Co.'s Juan de la Vina 2, share 156, San Salvador Del Tule Grant, 3500 ft ne of discovery, dr 375 ft.

Jim Wells County—Henshaw Bros. et al's Miguel 1, center lots 25 and 32, sec 89, Haldeman subd, SK&K sur, 1 mi ne of Premont field, lcn.

McMullen County—Cities Service Oil Co.'s Lowe Ranch B-2, A. J. Martin sur 130, 8 mi ne of Munson field, dr 612 ft. F. H. Gohlke, Miles Ranch 3, s½ e½ blk 9, Miles Ranch subd, Wm. Kohfler sur 78, 9½ mi ne Munson field, lcn. Roger Putman's Claunch 1, Michael Hely sur, 1 mi s Calliham, dr 1000 ft.

Victoria County—Trinity Drillers et al's Vogt 1, 51.93-ac lease, lot 2, Four League Grant to the Town of Victoria, lcn.

Webb County—Circle Oil Co.'s Hughes 1, n½ nw sur 1527, blk 1, 12 mi nw Lopez field, dr 1218 ft. O. W. Killam's Bruni 64, sur 446, 2 mi s O'Hern field, dr 740 ft.

COMPLETIONS

Bastrop County—Marts & Beavens, Ferguson 1, James Doyle sur, 5¾ mi se Cedar Creek, abnd in Edwards 2175 ft.

Bee County—Humble's Ruckman 1, 500-ac lease in Thomas Mancha sur, 1½ mi s Monteola, 7 mi nw Pettus, abnd in 2808 ft. Texas Gulf Producing Co.'s Culpepper 1, block 7, Culpepper Land subd, 2 mi w of Beeville, abnd 5520 ft.

Caldwell County—Boomer Oil Co.'s Camp 1, J. H. Bowman sur, 5 mi n Lockhart, abnd 1880 ft. J. D. Monk's Williams 1, 75-ac lease, J. J. Bowman sur, 2 mi e Salt Flats, abnd 3015 ft.

McMullen County — Cities Service's Lowe B-2, sur 130, abnd 1612 ft.

Milam County—W. H. Lawrence's Bartek 1, Jose Antonio de Pena Grant, 3 mi e Buckholts, abnd 1652 ft.

Nueces County—Shield Oil Co.'s Mienholdt 1, lot 11, section 9, 1 mi north of discovery well of Robstown field, abnd 6005 ft.

Starr County—Magnolia's Yzaguirre 2, La Sal Colorado Grant, 6 mi nw of Sun, abnd 6814 ft.

Victoria County—Barnsdall's Keeran Ranch 1-a, Martin de Leon sur, 17.3 barrels, 31.4-gr oil, ¼-inch top, ⅜-inch bottom, 285 pounds tubing, 2250 pounds casing pressure, perforated 5550-52 ft, gas-oil ratio 97,000 to 1.

Williamson County—W. O. Caffey's Shaw 1, P. Cartwright sur No. 6, abnd 990 ft.

NORTH TEXAS

FIRST REPORTS

Clay County—J. A. Coker et al's W. A. Henderson 1, 2450 ft e and 2300 ft s of nwc S. Hernandez sur A-185, 3 mi e and 1 mi s Thornberry, dr 700 ft. W. H. McKenzie et al's R. L. Ligon 1, 2400 ft from n and 700 ft from w lines of east 230-acres of blk 133, Byers subdiv 1¾ mi nw Byers, sp. Ted A. Norwood et al's G. S. Myers-Texaco 1, 150 ft from nw and ne lines s½ of n½ lot 48, Bacon subdiv, 3 mi e and 2 mi s Thornberry, abnd 1330 ft.

Cooke County—C. E. Lynch et al's A. Hellman 1, 150 ft n thence 150 ft e of nwc of BBB&C sur No. 15, A-147, but in Thos. Toby sur A-1060, 5 mi s Muenster, dr 400 ft. E. F. Peters et al's Frank Klement 1, 400 ft out of nwc lot 12, Thos. Scott sur A-900, lcn.

Montague County—Texas Co.'s P. J. Martin 1, 990 ft from s and 2734 ft from w lines C. A. Barnes sur A-48, top lime 1827 ft, dr 1835 ft.

Wichita County—J. M. Corbett et al's F. C. Dodson 2, 2351 ft n and 150 ft w of m/s/se corner of tract, lot 2, W. H. Anderson sur A-1, 5 mi se Burkburnett, sd 1366 ft.

COMPLETIONS

Baylor County — British-American O. P. Co.'s C. E. Holman 1, 1568 ft out of nec of 235.7-ac tr, T&NO Ry. sec 194, abnd 5002 ft.

Wilbarger County—King Oil Co. et al's W. T. Waggoner 1-U, 2970 ft from e and 1658 ft from s lines H&TC sec 5, blk 17, trace oil in lime 3808-24 ft, top K-M-A lime 4010 ft, top Ellenberger 4525 ft, abnd 4622 ft.

Young County—Henry Craig et al's J. R. Castleman 1, 150 ft from s and 1050 ft from e lines TE&L Co. sec 80, Gunsight lime 1115-25 ft, abnd 1243 ft.

TEXAS GULF COAST

FIRST REPORT

Harris County—Cities Service's Cook 1, West Ogburn area, 990 ft s and 990 ft e H&TC sec 60, lcn.

COMPLETION

Harris County—Gulf's Roberts 1, A. Roberts sur, Cypress area, abnd 7583 ft.

WYOMING

COMPLETION

Carbon County—Gaylord & Martin's Horne 1, cnl nw sw 22-22n-78w, Horne structure, 7,000,000 cu ft gas Muddy sand 750-805 ft. Well plugged back, td 1200 ft.

Spacing change sought for K-M-A river bed wells

A hearing to consider adjustments ordered recently for river-bed wells in the K-M-A field, Wichita County, has been scheduled by the Texas Railroad Commission for January 16 at Austin.

After a hearing on these wells last August, the commission entered an order assigning 10 acres to each well for proration purposes. Shortly before Christmas, the commission entered another order assigning a 20-acre allowance to these properties. Offsetting owners protested this change.

William M. Barret, Inc.
Consulting Geophysicists
Specializing in Magnetic Surveys
Contracts accepted for domestic and foreign projects, using the most improved instrumental and interpretative technique.
GIDDENS-LANE BUILDING
SHREVEPORT, LOUISIANA

THE FORT WORTH LABORATORIES
Analysis of oil field brines, cores, gas, oil, and minerals. Field gas testing. R. H. Fash, Vice-President; Long Distance 138. 823½ Monroe Street, Fort Worth, Texas.

JACK A. SCHLEY
Patent Attorney
(Established 1902)
PATENTS—INFRINGEMENTS—OPINIONS
San Antonio—Washington, D. C.
906 SECOND NAT'L BANK BLDG. — HOUSTON
1807-11 TOWER PETROLEUM BLDG. — DALLAS

PATENTS
Patents, Trade Marks, Copyrights and Infringement Litigation
HARDWAY & CATHEY
428-29-30 Bankers Mortgage Bldg.
Phone Capitol 9756 Houston, Texas

HOUSTON LABORATORIES
Analytical and Consulting Chemist
Podbielniak Gas Analysis
Oil Field Brines, Waters and Cores
Complete Evaluation of Crude Oils
Long Distance 267, Box 132, Houston, Texas

ATTENTION OIL OPERATORS
We Buy
PRODUCING ROYALTIES
ROPER & TODD
Esperson Bldg. Houston, Texas

HOARD EXPLORATION CO.
Seismic Surveys
In Mississippi since 1936
Mississippi Branch Office
Heidelberg Hotel . . . Jackson

MAILING LISTS
Of The Oil Industry
Up-to-Date — Guaranteed
OIL INDUSTRY MAILING LIST CO.
Tulsa Loan Bldg. Tulsa, Okla.

Enjoy 1940 Ease and Beauty In Braniff's New 21-Passenger Douglas Super-B-Liners

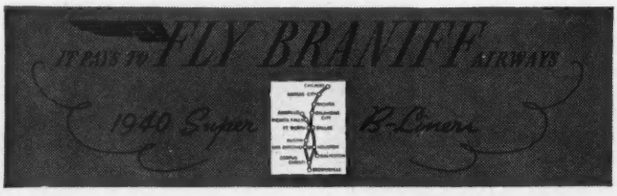
WITHOUT a peer in today's sky, these 1940 Douglas DC-3's bring *New* roominess and comfort to discriminating travelers between the Great Lakes and the Gulf.

Under the expert guidance of Jeanne Braniff, color stylists and interior decorators have created a new sense of ease and relaxation in an atmosphere of friendliness and warmth. From gleaming *New 1940* sky pantries, Braniff's full-course hot meals are graciously served by lovely college girl hostesses.

Engineers, too, have provided *New 1940* efficiency and dependability. Constantly synchronized full-feathering propellers assure added quiet and security. Automatic Direction Finders provide 1940's newest aid to navigation.

The Southwest's Golden Prosperity Belt gave Braniff an increase of more than 60% last year. To other enterprises this amazingly prosperous area yielded equally astonishing results. If you have not yet discovered the pleasure and profit of flying, do so now. In 1940, join the 40,000 more who will enjoy the comfort, luxury and prosperity of the new decade by flying the Super-B-Liners.

M-11



A Resolution

EASY TO KEEP!

"The Entirely Different Boiler and Engine Treatment"

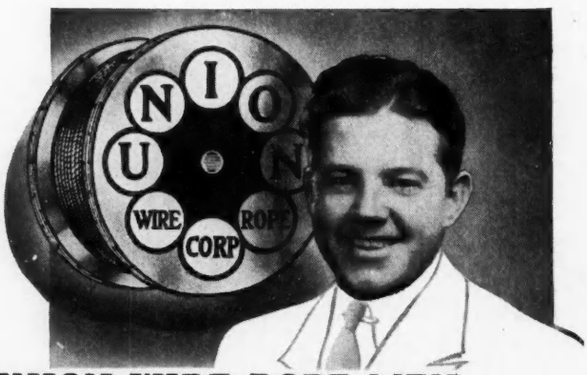
Hundreds of power plants throughout the world have resolved not to tolerate scale and corrosion in their boilers and engines. They know this resolution will not be broken because—

SAND-BANUM IS ON THE JOB!

They know from experience that this pure colloidal concentrate "does a better job" regardless of the operating conditions or the nature of the water used. They appreciate its simplicity and convenience because it saves them time and money. It comes in 16-oz. cans—ready to use and each can safely protects a 250 Hp. boiler for a month!

YOU, TOO, CAN KNOW ITS MERIT BEFORE YOU BUY! Try it in your own equipment for 30, 60 or 90 days. Then if you are not satisfied . . . YOU PAY US NOTHING!

AMERICAN SAND-BANUM CO., Inc.
9 Rockefeller Plaza **New York City**
WESTERN SAND-BANUM CO.
Houston, Texas **Fresno, Calif.**



UNION WIRE ROPE MEN
Know Their Rope Dope!

Our salesmen—available through our distributors—are *trained* to analyze your rope problem efficiently. Our Engineering Staff is ready to use these analyses for recommendations for "ultimate low cost." Wire, write or consult your Telephone Directory.

UNION WIRE ROPE CORPORATION
2104 Manchester Ave. Kansas City, Mo.

UNION Wire Ropes

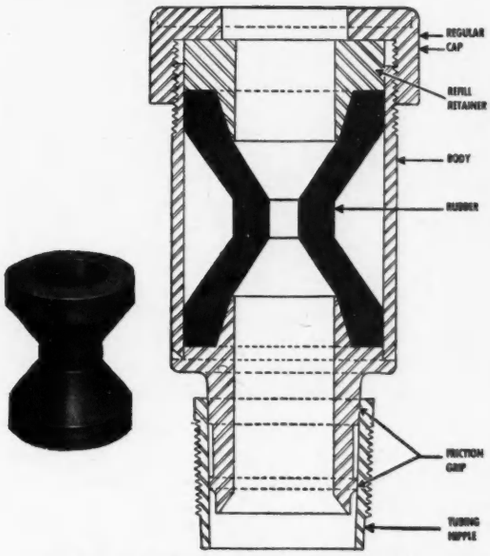
A The "ULTIMATE LOW COST WIRE ROPE"

NOTES FOR THE Equipment Buyer and User

Sucker Rod Wiper

PATTERSON-BALLAGH CORPORATION

An inexpensive, effective wiper for low pressure wells has been developed by Patterson-Ballagh Corporation, 1908 East 65th Street, Los Angeles. A replaceable spool of wear-resistant rubber



Patterson-Ballagh Sucker Rod Wiper

is incorporated within a housing equipped with either a regular cap or a safety cap. Only the rubber comes in contact with the sucker rod. The rods are effectively wiped so that no appreciable oil remains on the rod or coupling. When the pump reaches the surface it is unnecessary to slow down because the friction grip of the body is released by the slight impact against the rubber cushions and the wiper follows the pump up into the derrick. A safety cover is available with a double latch to hold couplings in case they start to drop back into the well. The body is a friction grip into a standard 3-inch pipe, with full clearance for all sizes of pumps.

Hard-Facing Rod

HAYNES STELLITE COMPANY

Haynes "93" hard-facing rod, a new alloy welding rod for hard-surfacing wearing parts, has been announced by Haynes Stellite Company, Kokomo, Indiana, unit of Union Carbide and Carbon Corporation. It is recommended for use where severe abrasion, accompanied by only a moderate amount of impact, is encountered. It has already proved successful on dredge pump impellers, cement clinker crusher rolls, slag crusher roll teeth, cinder crusher rolls, tamper feet for cinder block manufacturing, tube bending mandrels, farm implements, and other wearing parts.

The new alloy rod does not possess as high wear resistance as Haystellite cast tungsten carbide products or Haynes Stellite alloys. It is, on the other hand, more wear-resistant but not as tough as Hascrome hard-facing alloy. It thus enables Haynes Stellite Company to offer an even more complete line of hard-facing materials ranging from the toughest, most impact-resistant, to the hardest, most wear-resistant types.

Haynes "93" alloy rod is of a ferrous composition and contains chromium, molybdenum, cobalt, and other alloying elements to the extent of more than 40 percent. It has a tensile strength of about 43,000 pounds per square inch and a hardness, as-deposited by oxy-acetylene welding, of 62 Rockwell C. When deposits are heat-treated by heating to 1950° F. and then air-cooling, the hardness reaches 66 to 67 Rockwell C.

Application of Haynes "93" alloy rod is relatively simple. It can be applied by either the oxy-acetylene or the metallic arc process. It is readily handled under the oxy-acetylene flame with a slightly carburizing (excess acetylene) flame. When the new rod is applied by the metallic arc process, reversed polarity is used, and flux-coated rods are recommended.

Safety Joint

S. R. BOWEN COMPANY

S. R. Bowen Company, Santa Fe Springs, California, announces a new and improved Safety Joint for use in the drilling or fishing string. This joint, the company says, has a number of special features which contribute to safety and positive operation regardless of drilling or fishing conditions.

Simple construction and fool-proof operation are important features of the joint. They insure the user that the string can be disconnected quickly at the joint, and that he can reengage it at will. The tool has only two steel parts—a pin and a box section—equipped with high-pressure packer rubbers which seal off fluid inside and outside the string under any pressure. Outside diameters and fluid passages on all joints are the same as tool joints of corresponding sizes, thus in no way interfering with running wire line instruments, etc., through the drill pipe.

Another important feature is that nothing but definite mechanical actions, controlled by the operator, will cause it to come apart in the string. In fact, the joint is so constructed that rough drilling or excessive vibration actually tend to make the tool up tighter. Bit or drill collar inertia while rotating out of the hole will not affect the make-up of the joint. The two halves are in constant tight engagement, permitting no wear.

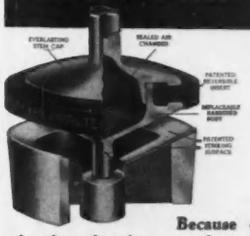
American Chain & Cable Company Announces Personnel Changes

C. N. Johns, a vice president of American Chain & Cable Company, Inc., has been placed in charge of operations, to take over the duties of C. G. Williams, a vice president, whose resignation is announced. Johns is a graduate of the University of Missouri. He has had many years of experience in the steel industry, particularly in the manufacture of wire and wire specialties. In 1913 he joined Page Steel & Wire Company, now a division of American Chain & Cable Company, in the operating department at Monessen, Pennsylvania. After serving as assistant manager, he was made manager of the plant and then was appointed general manager of Page Steel and Wire Division, which post he has held for several years. His 27 years with the company were interrupted only during the World War while he was in the service.

George C. Moon, a vice president of American Chain & Cable Company, Inc., has been appointed general manager of sales of the company. Moon, after operating the George C. Moon Company for a number of years, became vice president of American Cable Company when it absorbed the George

For Month In - Month Out Service

USE MacCLATCHIE "AIRFLOTE" MUD PUMP VALVES



Because of the sealed-in air chamber that increases buoyancy . . . cuts fluid slippage . . . reduces impact . . . and gives more efficient valve action, MacClatchie "Airflote" Pump Valves insure superior performance and longer life under the toughest pumping conditions. Replaceable bodies, reversible inserts and everlasting stem caps give true MacClatchie economy.

MacClatchie "Streamlined" Pump Valves give you *high* quality at *lowest* cost! Of solid one-piece construction, they're streamlined at every point to assure unobstructed fluid flow. Valve Seats (interchangeable with "Airflotes") have 20% to 100% *more* striking surface than others, PLUS patented cross-bar construction.

All MacClatchie Valves are guaranteed against cutting out the pump. *See our representative or write direct to factory for details on this guarantee.*

MacCLATCHIE MANUFACTURING CO.
COMPTON, CALIFORNIA
Mid-Continent Distributor, MAKE TOOL COMPANY, Houston, Texas
Rocky Mountain Representative, E. C. DILGARDE, Casper, Wyoming
Foreign, GEORGE R. WOODS, 17 Battery Place, New York, N. Y.

OTIS

Pressure Operated Unions, Square Kelly Drilling Heads, Tubing Control Heads for running and pulling pipe under pressure, Type G Tubing Heads, and Tubing Strippers . . . All manufactured by

OTIS PRESSURE CONTROL, INC.

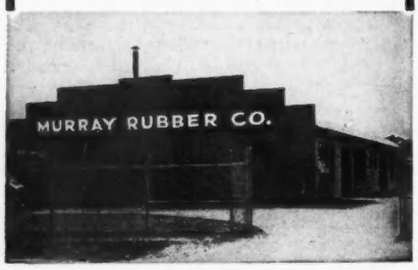
ARE EQUIPPED WITH

MURRAY RUBBER

Our modern facilities and strict supervision of all work enable us to give the highest quality and efficient service on mechanical rubber goods and synthetic oil-resisting products.

MURRAY
RUBBER COMPANY

606-8 N. Milby **Preston 7017**
HOUSTON, TEXAS



PROTECT
COSTLY MAPS; TRACINGS

With
This Last Word in
FILING CABINETS

Our improved Map Filing Cabinets offer a convenient and accurate method of filing and protecting maps and tracings of larger than average size . . . yet keeping them at your finger tips. These Cabinets have individual wells for each map, eliminating need for paper tubes. Adjusting blocks are provided for maps shorter than depth of well.

Stock sizes include 60, 100, 150 and 200-map capacity cabinets in both walnut and oak finish. Cabinets made to fit your specification on short notice.

PORT CITY CABINET WORKS
HOUSTON, TEXAS
609-13 Quitman St. **Phone Pres. 0725**
300 miles freight allowance.

NOTES FOR THE Equipment Buyer and User

C. Moon Company. He became associated with American Chain & Cable Company 14 years ago when that concern took over American Cable Company. In addition to his duties as a vice president, which office he has held for several years, he has had supervision of sales of the wire rope divisions and has been particularly active in the development of markets for preformed wire rope. He will continue active supervision of wire rope sales in connection with the wider responsibilities of his new duties. His headquarters will remain at 230 Park Avenue, New York.

William D. Kirkpatrick, who has been general manager of sales of American Chain Division, has been elected a vice president of American Chain & Cable Company. Kirkpatrick has been with the company for more than 25 years. A graduate of Lafayette College, class of 1910, he entered the employ of Weed Chain Tire Grip Company in 1914, as a salesman in the Philadelphia district. In 1915 Weed Chain Tire Grip Company was merged with American Chain Company, now American Chain & Cable Company, Inc. He became sales manager of Philadelphia district in 1917 and was made sales manager of Chicago district in 1928. In 1934, he was transferred to Bridgeport, Conn., as sales manager of the automotive accessories division, and in 1936 he became general manager of sales of the American Chain Division, with headquarters at York, Penn. He will continue his headquarters at York, Penn., where he has supervision of the sales activities which are directed from that city, covering Weed tire chains, welded and weldless chains, Manley automotive service station equipment, Wright hoists and malleable castings.

GEORGE C. MOON
General Manager of Sales, American Chain & Cable Company.

Mullen Made Assistant Manager of Sales for Pittsburgh Steel

L. A. Mullen has been appointed assistant manager of sales for Pittsburgh Steel Company and assumed his duties in the general offices of the company at Pittsburgh, Pa., on January 1. Mullen has been associated with the company since January, 1938; first, as assistant district sales manager at New York and later as district sales manager at Chicago. Before coming to Pittsburgh Steel Company, Mullen for 10 years had been associated with Republic Steel Corporation in various sales capacities.

Westinghouse Names Two New Directors

Two new directors of Westinghouse Electric & Manufacturing Company were elected at a recent board meeting of the company. They are George A. Blackmore, president of Westinghouse Air Brake Company of Pittsburgh and of Union Switch & Signal Company of Swissvale, Pennsylvania, and Arthur W. Page, a vice president and director of American Telephone & Telegraph Company of New York, and a director of Continental Oil Company.

Baker Oil Tools, Inc., has announced the removal of its general offices to 6000 South Boyle Avenue, Los Angeles, California. The mail address becomes P. O. Box 127, Vernon Station, Los Angeles.

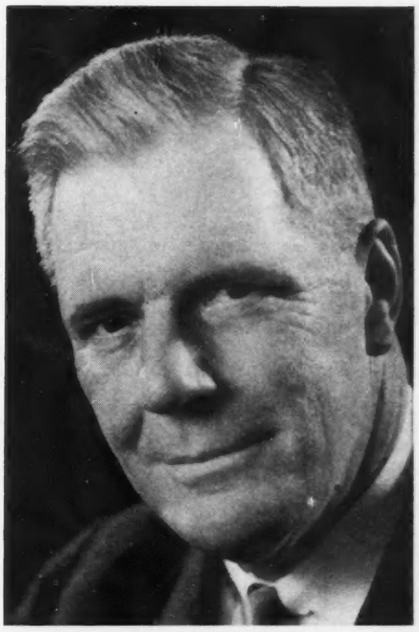
NOTES FOR THE Equipment Buyer and User

J. F. Lincoln on Tour Addressing Engineering Groups

J. F. Lincoln, president of The Lincoln Electric Company, is on an extensive speaking tour. His itinerary includes 12 principal cities in the South, Southwest and West.

Lincoln's first engagement is as guest speaker at the annual banquet of the Charlotte Engineers Club of Charlotte, North Carolina, on January 11. He will talk on the subject, "Government Is Made for Man, Not Man for Government."

Other cities in which Lincoln will address executive, engineering and industrial groups, include the following: Birmingham, New Orleans, Houston, Los Angeles, San Francisco, Portland, Seattle, Pueblo, Denver, Chicago, and Salt Lake City. He expects to return to Cleveland by February 17.



J. F. LINCOLN
President, The Lincoln Electric Company

Texoma Supply Company Opens District Sales Office at Houston

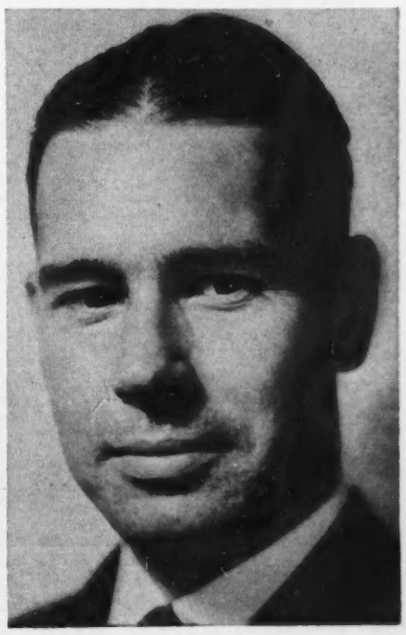
Texoma Supply Company, Tulsa, announces the opening of district sales offices in Houston, Texas. Harry H. Swan has been appointed district sales manager, his offices located in the West Building.

Well Equipment Opens Branch in Fort Worth

Well Equipment Manufacturing Corporation, Houston, announces opening of a branch sales office in Fort Worth, Texas, located at 707 Petroleum Building. E. L. Oliver has been moved from Houston as district manager and will cover the West, North and East Texas area, North Louisiana, Arkansas, Oklahoma, Kansas and Illinois.

C. A. Polk, formerly district manager on the West Coast, and for the past few months located in Houston, has been appointed district manager in

C. A. POLK



E. L. OLIVER

Standco
NO-SMOKE
STANDCO BRAKE LINING
Stands the gaff and gets the job done without scoring brake rims. See page 2100 Composite Catalog.
Standco Brake Lining Co.
HOUSTON

REED'S 'B-R' DRILLING BIT WITH WIRE LINE RETRACTABLE CORE BARREL

HARD FORMATION HEAD (Interchangeable with Soft Formation Head)

REED 'B-R' Drill Collar and 3-Blade Drilling Bit with Core Barrel in position

REED ROLLER BIT CO.

The OTIS REMOVABLE TUBING SAFETY VALVE is also a sure safeguard against disaster, protecting your well against running wild due to damage or failure of surface controls.

Wells with dangerously high surface working pressures, wells located out in water, in townsites, and in unpredictable foreign fields . . . all need the protection that the OTIS REMOVABLE TUBING SAFETY VALVE affords.

WRITE OTIS TODAY
PRESSURE CONTROL
INCORPORATED
DALLAS, TEXAS

NOTES FOR THE Equipment Buyer and User

charge of the Texas and Louisiana Gulf Coast territory and Southwest Texas.

Continued growth calls for further expansion in the home office and plant, which was erected about two years ago, and plans are being prepared for a building program which will materially increase the size of the general office, warehouse and factory.

Ted Sutter New President of Los Angeles Nomads

Ted Sutter, Baker Oil Tools, was elected president of the Los Angeles Chapter of Nomads at the January monthly meeting, succeeding E. L. Decker, Martin-Decker Corporation, Long Beach, who was re-elected national regent.

Other officers elected were: S. R. Bowen of S. R. Bowen & Company, vice president; W. F. Bettis of M. O. Johnson Oilfield Service, secretary-treasurer; E. M. Rees of Fluid Packed Pump Company, assistant secretary-treasurer; E. B. Fowks of Emsco Derrick & Equipment Company, sergeant-at-arms, and S. R. Robinson of Yowell Service Company, assistant sergeant-at-arms. W. F. Bettis was re-elected national regent.

At the dinner following the meeting the retiring president, E. L. Decker, was presented with a key embellished with the derrick emblem of the Nomads. The presentation was made by Bill Bettis, who also presented both Decker and Sutter with gavels.

Short talks were given by "Brick" Elliott and Abe Haglund who have just returned from foreign trips. "Frosty" Martin then told of some Canadian experiences of many years ago.

The speaker of the evening was Dr. Thomas Clements of the University of Southern California, who was introduced by John Dodge, professor of petroleum engineering at the University of Southern California.

Dr. Clements illustrated his address with colored slides which showed scenes in Colombia, where he recently did extensive geological work.

Byron Jackson Company Wins Suit on Tong Patent Infringement

Byron Jackson Company has won an important patent case in a decision rendered by Judge Colin Neblett of the United States District Court at Santa Fe, New Mexico. This company manufactures BJ Oil Well Tongs and brought suit in the federal court in New Mexico against Malcolm E. Self and Harry Bass Drilling Company of Hobbs, New Mexico, for infringement of five patents held by it covering its tongs. It was charged that these patents were infringed because the defendants were engaged in the practice of adding to the plaintiff's patented tongs an additional jaw which adapted them for use on sizes of pipe for which they were not manufactured. In his decision, rendered December 5, 1939, Judge Neblett has ruled that this practice is an infringement of Byron Jackson Company patents and has awarded an injunction restraining the defendants from engaging further in the practice. In rendering the decision, the court indicated that Byron Jackson Company was within its patent rights in determining for what particular sizes of pipe its tongs should be designed and that others could not interfere without violating the patents.

NEW OFFICERS OF LOS ANGELES CHAPTER OF NOMADS

Seated, left to right: S. R. Bowen, vice president; Ted Sutter, president. Standing, left to right: S. R. Robinson, assistant sergeant-at-arms; E. B. Fowkes, sergeant-at-arms; E. L. Decker, retiring president, national regent; W. F. Bettis, secretary-treasurer and national regent, E. M. Rees, assistant secretary-treasurer.

Braden Winch Company Wins Patent Suit

A patent infringement suit by an eastern manufacturer against Braden Winch Company, of Tulsa, has been concluded in favor of the Braden Company. The case was tried in the United States District Court for the Northern District of Oklahoma, with Judge Kennamer presiding. The court held that there was no infringement of the plaintiff's patent by the machines of Braden Winch Company.

The plaintiff's suit was predicated on the claim that it held patents which gave it the exclusive right to manufacture winches adaptable for attaching to the side frames of trucks which are reversible so that they may be power driven at either the right or left end. After argument by defendant's attorney showing that the practice of constructing winches in the manner described was "old in the art," antedating plaintiff's patents, the court ruled that no further defense was necessary and sustained a motion for a directed verdict favoring the defendant.

Moore Takes Over Timken Steel Sales

W. B. Moore, associated for 20 years with The Timken Roller Bearing Company in various sales activities, has been appointed director of sales of the Steel and Tube Division.

Moore came with the company as an engineer early in 1919 after his graduation from the University of Michigan. After several years of engineering and sales training in the Canton office, he was placed in charge of the Pacific Coast district, which position he held for several years. Since 1933 he has been manager of industrial sales.

The position vacated by Moore will be filled by S. C. Partridge who came with the company in 1921 after graduating as a mechanical engineer.

D. Stanley Mair Dead

D. Stanley Mair, president of the D. S. Mair Machinery Corporation, died January 8 in a Houston hospital. Burial was in Glenwood Cemetery, Houston, the following day.

Squeaks from the Bull Wheel

Strict Confidence

"If you tell a man anything, it goes in one ear and out of the other."

"And if you tell a woman anything, it goes in at both ears and out of her mouth."

Hair Trigger

"Women use more powder than men."

"Yes, and they're better shots."

Pappy Is Happy

"Good morning, Mrs. Kelly," said the doctor, "did you take your husband's temperature, as I told you?"

"Yes, doctor, I borrowed a barometer and placed it on his chest; it said 'very dry' so I bought him a pint o' beer and he's gone back to work."

Ahem

"Is the head of the house in, sonny?"

"No, sir. There's nobody home but Dad and me."

Cause and Effect

"The Chinese make it an invariable rule to settle all their debts on New Year's Day."

"So I understand, but then, the Chinese don't have a Christmas the week before."

Hm-m

"Why are you reducing?"

"Oh, to cut down expanses."

They'll Meet Later On

"How about having some piscatorial diversion tomorrow?"

"Sorry, but I can't. I'm going fishing."

Changing Lead to Gold

Two young Irishmen in a Canadian regiment were going into the trenches for the first time, and their captain promised a dollar for every one of the enemy they killed.

Pat lay down to rest while Mike watched. Pat had not lain long when he was awakened by Mike shouting:

"They're coming; they're coming."

"Who's coming?" shouts Pat.

"The enemy," replies Mike.

"How many?" shouts Pat.

"About fifty thousand," says Mike.

"Begorra," shouts Pat, jumping up and grabbing his rifle, "our fortune's made."

Different Positions

"So you're a young man with both feet on the ground, eh; what do you do for a living?"

"I take orders from a man with both feet on the desk."

Hey, That Man's in Again

"Know anyone who can tell me the merits of a straight razor?"

"Sure; ask the man who hones one."

Correct

If you have $10 in one pocket and $15 in the other, what have you?

The wrong pants.

Rubbing It In

Bill hadn't heard from Mary in over a year. One day she called him up at the office and asked him to lend her his full dress suit. Bill told her to go over to his house and get it. He'd call up the landlady and it would be O. K.

About six months later, Bill was invited to a wedding. Then he was reminded that Mary hadn't returned the dress suit.

That got him sore. So he called her up on the phone.

"Look here," he snapped at her. "Did you borrow that dress suit forever?"

"Yes," she answered sweetly. "We buried my father in it."

Queer Is Right

They certainly have some queer names in Texas. There is a little town up near the Oklahoma line by the name of Monday. The leading hotel in Mineral Wells is called the "Crazy Hotel." There's a hotel in Terrell called the Bugg House. An eastern traveling man while making the state, wishing to keep his house informed as to what town or hotel he would be at on certain days so as to get his mail, he sent his firm the following message: Monday—Tuesday; Crazy—Wednesday; Bugg House—Thursday. His firm wired back, "If that's the way it affects you, lay off of it."

No Sleep

Muriel: "I always think of all the unkind things that I've said during the day before I go to sleep at night."

Her Best Friend: "You don't say so! How can you do with so little sleep?"

Typical

"What kind of car was it that hit you?"

"I don't know, but the woman driving it had on a dress just like the one Mary Simmons paid $69.75 for."

Stumped

"Tell that fat woman she'll have to take that big hat off the seat and hold it in her lap."

The user came back a few seconds later and asked the chief: "What'll I do now? She says she ain't got no lap."

A Good Bargain

"How are you this morning?"

"Not at all myself."

"Then I congratulate you. Whoever else you are, you will be a gainer by the bargain."

The Stuff Was Potent

"Will that cleaning fluid really make things clean?"

"Say, lady, I rubbed some of it on a copy of 'Scandalous Stories' and it turned into 'The Sunday School Advocate'."

Out of Style

"My dear, your dress is cut much too low in the back."

"I know it. But it's all my husband's fault. That's really the front of the dress, but he made me turn it around."

"Texas, Oil and Gas Since 1543"

by

C. A. WARNER

Petroleum Engineer and Geologist
Houston Oil Company

This book combines the rich, human interest features of the oil and gas industry in Texas since its beginning with the cold, statistical facts revealed in the more than 150 pages of tabular matter included.

In view of the ever-increasing importance of the oil and gas industry of the State of Texas and the fact that the number of pioneers of this industry is decreasing from year to year, it has been deemed advisable to present a history of the industry in this State, based on authentic information and prepared for ready reference.

To this end, years of time have been devoted to the collection and authentication of data from all reliable sources and to the compilation in compact form of the information thus secured.

487 Pages Fabrikoid Binding

Price $5.00

Send orders to the

GULF PUBLISHING COMPANY

P. O. Drawer 2811

HOUSTON, TEXAS

INDEX TO ADVERTISERS

***Indicates that detailed information on the manufacturers' products or services may be found in the 1940 Edition of The Composite Catalog of Oil Field & Pipe Line Equipment.**

A — Page

*J. S. Abercrombie Co. — —
*Abercrombie Pump Co. — —
Acme Gas Lift Co. — —
Air Reduction Sales Co. — 42
*Ajax Iron Works — —
*Allsteel Products Manufacturing Co. — —
*Alten's Foundry & Machine Works — —
Alumin Ore Company — —
*Aluminum Company of America — —
American Askania Corp. — —
American Assn. of Petroleum Geologists — —
*American Cable Division of American Chain & Cable Co. — —
American Cast Iron Pipe Co. — —
*American Hammered Piston Ring Division of Koppers Co. — —
*American Iron & Machine Works Co. — —
*American Manganese Steel Division of The American Brake Shoe & Foundry Co. — —
*American Meter Co. — —
*American Sand-Banum Co. — 68
*American Steel & Wire Co. — —
Atlas Powder Co. — —
*Axelson Manufacturing Co. — —

B

*Baash-Ross Tool Co. — 7
*Baker Oil Tools, Inc. — —
*Baldwin-Duckworth Division of Chain Belt Co. — —
*Bantam Bearings Corp. — —
*Baroid Sales Division — —
William M. Barret, Inc. — 67
*Bartlett-Hayward Division of Koppers Co. — —
Bethlehem-International Supply Co. — —
*Bethlehem Steel Co. — 50
Beverly Hotel — 56
*Black, Sivalls & Bryson — —
Hotel Blackstone — —
*Bradford Motor Works — —
Braniff Airways, Inc. — 68
*The Brewster Co. — —
The Bridgeport Machine Co. — —
*Broderick & Bascom Rope Co. — —
A. M. Byers Co. — —
*Byron Jackson Co. — —

C

Jo H. Cable — —
*Cameron Iron Works — 40-41
*Cardwell Manufacturing Co. — —
Carnegie-Illinois Steel Corp. — —
*J. I. Case Co. — —
*Caterpillar Tractor Co. — —
*Chain Belt Co. — —
*Chiksan Tool Co. — —
*Clark Bros. Co. — 32-33
Clark Machine Co. — —
*Climax Molybdenum Co. — —
Columbian Steel Tank Co. — —
*Continental Motors Corp. — —
Continental Oil Co. — —
The Continental Supply Co. — 21
*Fred E. Cooper Co. — —
*The Cooper-Bessemer Corp. — —
*Core Laboratories, Inc. — —
*Crane Co. — —
*Crum-Brainard — —
W. H. Curtin Co. — —

D

*Darling Valve & Manufacturing Co. — 6
De La Vergne Engine Division of Baldwin-Southwark Corp. — —
Thos. Devlin Manufacturing Co. — 4
*Diamond Chain & Manufacturing Co. — —
*Dowell Incorporated — 8
*The Dragon Manufacturing Co. — —
*E. I. du Pont de Nemours & Co. — —

E

*Eastman Oil Well Survey Co. — —
Economy Electric Lantern Co. — —
Elastic Stop Nut Corp. — —
Elmax Construction Co. — —
Enardo Foundry & Manufacturing Co. — —

F

*Geo. E. Failing Supply Co. — —
First National Bank in Houston — —
First National Bank & Trust Co. of Tulsa — —
Fluid Packed Pump Company — —
Ford Motor Co. — —
The Fort Worth Clearing House Assn. — —
The Fort Worth Laboratories — 67
*Foster Cathead Co. — —
The Benjamin Franklin Hotel — —
*Franks Manufacturing Co. — —
Frick-Reid Supply Corp. — —
Frost National Bank — —

G

*Gardner-Denver Co. — —
*The Garlock Packing Co. — —
*Gas Lift Corp. — —
*Gaso Pump & Burner Manufacturing Co. — —
General Electric Co. — —
General Geophysical Co. — —
General Motors Corp. — —
Geophysical Service, Inc. — —
*Goodyear Tire & Rubber Co. — —
*H. P. Gott Manufacturing Co. — —
*Grant Oil Tool Co. — —
*Gray Tool Co. — —
*Green Head Bit & Supply Co. — —
*The Guiberson Corp. — 47
Gulf Envelope Co. — —
Gulf Publishing Co. — 4, 66 and 73

H

*Halliburton Oil Well Cementing Co. — First Cover
Hardway & Cathey — 67
*Harnischfeger Corp. — —
*Haynes Stellite Co. — —
*Hazard Wire Rope Division of American Chain & Cable Co. — Third Cover
The Hercules Powder Co. — —
The Hercules Steel Products Co. — —
*Hewitt Rubber Corp. — —
Hoard Exploration Co. — 67
*A. C. Horn Co. — —
Houston Laboratories — 67
*Hughes Tool Co. — Fourth Cover
Humble Oil & Refining Co. — —
Hyatt Bearings Division — —

I

Independent Exploration Co. — —
*The Inferno Co. — —
*Ingersoll-Rand Co. — —
*International Harvester Co. — 23
*The International Nickel Co. — 29

J

*D. O. James Manufacturing Co. — —
Jarecki Manufacturing Co. — —
*Jensen Brothers Manufacturing Co. — —
*Johns-Manville — —
*M. O. Johnston Oil Field Service Corp. — —
The S. M. Jones Co. — —
*Jones & Laughlin Steel Corp. — 49
The Jones Oil Co. — —
Jones-Shelburne, Inc. — —

K

The Kennedy Valve Manufacturing Co. — —
*Kerotest Manufacturing Co. — —
*Keuffel and Esser Co. — 45
*Kinzbach Tool Co. — —
*Koppers Co. — —
Kropp Forge Co. — —

L

Landis Machine Co. — —
*Lane-Wells Co. — 35
*Larkin Packer Co. — —
*The Layne & Bowler Co. — —
*Le Roi Co. — —
Lee Rubber and Tire Corp. — —
Hotel Lenox — —
*A. Leschen & Sons Rope Co. — —
*The Lincoln Electric Co. — 5
*Line Scale Co. — —
*Link Belt Co. — —
Lone Star Cement Corp. — —
*Lucey Boiler & Manufacturing Co. — —
*The Ludlow Valve Manufacturing Co. — —
*Lufkin Foundry & Machine Co. — —

M

*MacClatchie Manufacturing Co. — 69
Macwhyte Co. — —
*D. S. Mair Machinery Corp. — —
*Maloney Tank Manufacturing Co. — —
Manhattan Rubber Division — —
The Marley Co. — —
Marmon-Herrington Co. — —
*Martin-Decker Corp. — —
McCollum Exploration Co. — —
*McEvoy Co. — —
McGill Manufacturing Co. — —
McKissick Products Corp. — —
*Merco Centrifugal Co. — —
*Merco Nordstrom Valve Co. — —
*Merla Tool Corporation — —
*Metric Metal Works — —
*Midco Bailer Co. — —
*Miller Sand Pump Co. — —
*Mission Manufacturing Co. — —
*Lee C. Moore & Co. — —
*Morse Chain Co. — Second Cover
*Motor Improvements, Inc. — —
Mudrite Products Co. — —
Murray Rubber Co. — 70
Muskogee Iron Works — —

N

National Bank of Tulsa — —
*National Lead Co. — —
The National Supply Co. — 26-27
National Tube Co. — —
*Novo Engine Co. — —

O

*O.C.S. Manufacturing Co. — —
Walter O'Bannon Co. — —
*Oil Center Tool Co. — —
*Oil City Brass Works — —
Oil Industry Mailing List Co. — 67
Oil Well Supply Co. — 3
*Otis Pressure Control, Inc. — 71

P

*The Parkersburg Rig & Reel Co. — —
*Patterson-Ballagh Corp. — 65
*Pelican Well Tool & Supply Co. — 58
Petroleum Electric Power Assn. — 36
Petroleum Rectifying Co. of California — —
Petty Geophysical Engineering Co. — —
*Pittsburgh Equitable Meter Co. — —
*Pittsburgh Steel Co. — —
Hotel Pittsburgher — 60
Plymouth Cordage Co. — —
*Portable Rig Co. — —
Port City Cabinet Works — 70

R

Raybestos-Manhattan — —
Reading-Pratt & Cady Division of American Chain & Cable Co. — —
*Rector Well Equipment Co. — —
*Reda Pump Co. — —
*Reed Roller Bit Co. — 71
*Regan Forge & Engineering Co. — —
*Joseph Reid Gas Engine Co. — —
*Republic Steel Corp. — —
*The Ridge Tool Co. — 65
Roper & Todd — 67

S

Safety Gas Main Stopper Co. — —
Jack A. Schley — 67
*Schlumberger Well Surveying Corp. — —
The Second National Bank of Houston — —
Seismic Exploration Co. — —
Seismograph Service Corp. — —
Shell Oil Co., Inc. — —
*SKF Industries, Inc. — —
A. O. Smith Corp. — 10
*E. M. Smith Co. — —
*Howard Smith Co. — —
*South Chester Tube Co. — —
Southern Engine & Pump Co. — —
Southern Pacific Lines — —
Spang Chalfant, Inc. — —
*Sperry-Sun Well Surveying Co. — —
Standard Supply and Hardware Co. — —
*Standco Brake Lining Co. — 71
*Star Drilling Machine Co. — —
Stevens Hotel — —

T

*Templeton, Kenly & Co. — —
Texaco Development Corp. — —
The Texas Corp. — —
Texas Electric Steel Casting Co. — —
Texas Foundries, Inc. — —
*Texas Iron Works — —
Thermoid Rubber, Division of Thermoid Company — —
Thompson Tool Co. — —
*The Timken Roller Bearing Co. — —
Town House Hotel — —
*Tretolite Co. — —
Trinity Portland Cement Co. — —

U

*Union Wire Rope Corp. — 68
Union Carbide & Carbon Corp. — —
*Unit Rig & Equipment Co. — —
*United States Rubber Co. — —
United States Steel Corp. — 3
*Universal Atlas Cement Co. — —

V

*Vickers, Inc. — —

W

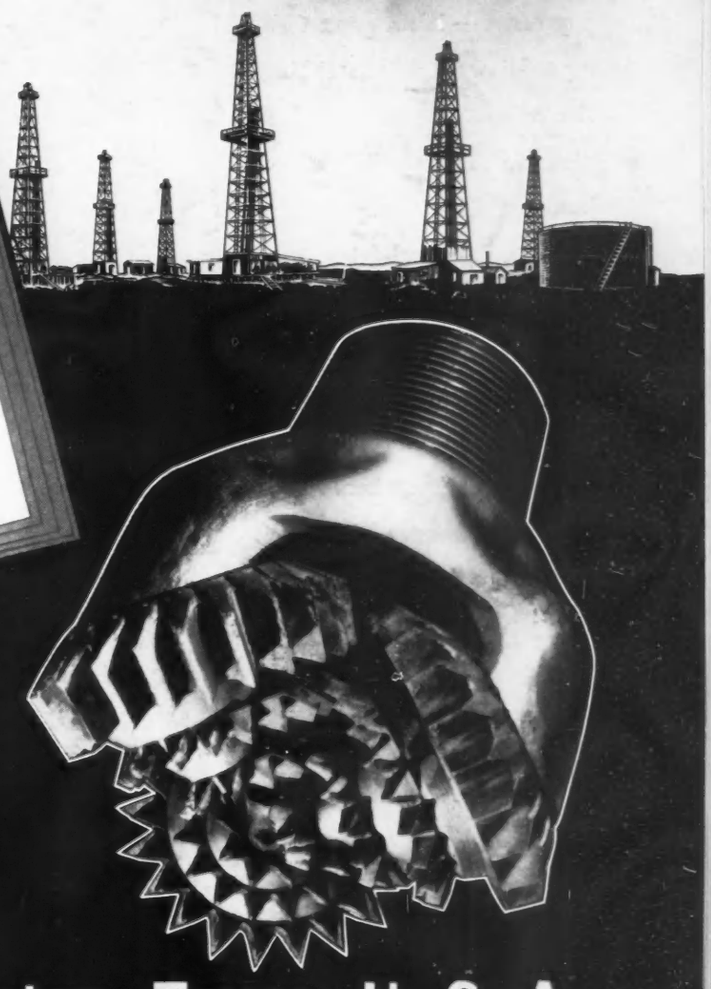
Warner & Swasey Co. — —
The Watson-Stillman Co. — —
*Waukesha Motor Co. — —
Webster Engineering Co. — —
*Well Machinery & Supply Co. — —
*Westinghouse Electric & Manufacturing Co. — —
*The Wheland Co. — —
*Wickwire Spencer Steel Co. — —
*J. H. Williams & Co. — —
*Wilson Manufacturing Co. — —
*Wilson Supply Co. — —
Witte Engine Works — —
*Worthington Pump & Machinery Corp. — —
Wyatt Metal & Boiler Works — —

Youngstown Sheet & Tube Co. — —

EXPERIENCE HAS PROVED

If it's a "HUGHES HOLE" All the way You won't have so many Round Trips.

Use HUGHES ROCK BITS - Stay on Bottom Longer - - - Make Faster - Straighter Hole!



Hughes Tool Company, Houston, Texas, U. S. A.

YOU CAN TELL BY THE LOG – THIS J&L INTEGRAL-JOINT DRILL PIPE IS MADE TO STAND UP UNDER BOTTOM-OF-THE-HOLE PUNISHMENT

When the roughnecks on your rig add another length to the drill stem — and you figure you're getting down close to pay sands — it's a great feeling to know they'll be stabbing the kelley to a string of drill pipe that's made to "dig at the bottom." That's why drillers like J & L Integral-Joint Drill Pipe. It's surer, for pin and box ends are upset right on the pipe which means there are no threaded connections of tool-joint to drill pipe where twist-offs and wash-outs often occur. J & L Integral-Joint Drill Pipe is made of J & L Controlled Quality Steel. It must prove its ability to do a job for you in the field by passing the rigid J & L 100% inspection in our mill. For your next well use J & L Integral-Joint Drill Pipe. There is a supply store near you that handles it.

J&L PIPE

JONES & LAUGHLIN STEEL CORPORATION

AMERICAN IRON AND STEEL WORKS
PITTSBURGH, PENNSYLVANIA

J & L — PARTNER IN PROGRESS TO AMERICAN INDUSTR

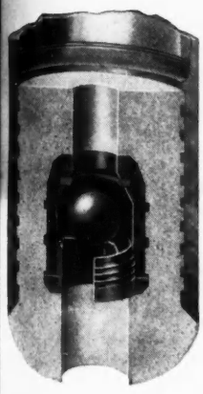
BAKER'S 12 POINT CHECK CHART FOR FLOATING EQUIPMENT

CHECK the Basic Features You Want in Floating Equipment; Then See How Many of These "Must" Features You Secure When You Specify BAKER

. . . and DON'T OVERLOOK the "Plus Values," those Semi-Intangible Factors that mean So Much to Busy, Modern Operators.

	DESIRABLE FEATURES IN FLOATING EQUIPMENT, OR "MUST HAVE"	BAKER FLOATING EQUIPMENT PROVIDES FEATURES CHECKED BELOW	CHECK BELOW THE FEATURES *YOU* WANT IN FLOATING EQUIPMENT
1	STRENGTH	✓	
2	SAFETY	✓	
3	AMPLE CIRCULATION PASSAGEWAYS	✓	
4	POSITIVE, LEAK-PROOF BACK-PRESSURE VALVE	✓	
5	EASY DRILLABILITY	✓	
6	THREADED CONNECTION TO FIT *ANY* TYPE CASING	✓	
7	UNIFORMITY	✓	
	"PLUS VALUES"		
8	SERVICE	✓	
9	CONVENIENTLY LOCATED STOCKS	✓	
10	BACKGROUND OF EXPERIENCE	✓	
11	CONSTANT IMPROVEMENT IN DESIGN AND MATERIALS	✓	
12	PEACE OF MIND	✓	

BAKER FLOATING UNITS



BAKER CEMENT FLOAT SHOE

BAKER CEMENT FLOAT COLLAR

BAKER CEMENT WASH-DOWN WHIRLER FLOAT SHOE

BAKER CEMENT WHIRLER BULL PLUG FLOAT SHOE

For complete details concerning the entire line of Baker Cement Guiding, Floating and Cementing Equipment see pages 217 to 234 of the Baker Section of the Composite Catalog.

BAKER OIL TOOLS, INC.
P. O. Box 127, Vernon Sta., Los Angeles, Calif.
P. O. Box 3048, Houston, Texas

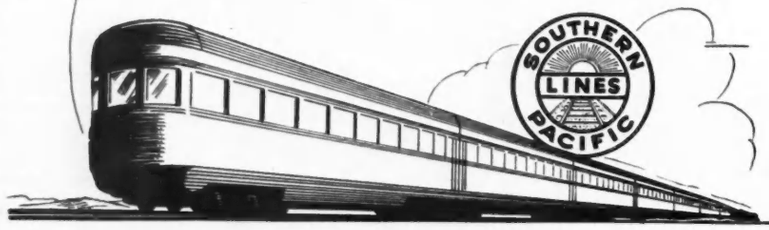
Smooth

Sunbeam

SUPER STREAMLINER

Between

HOUSTON - DALLAS



You feel no vibration as this orange, black and crimson *streamliner* glides over the 265 miles of giant rails in 265 minutes. One reason is because the *Sunbeam* is a *super streamliner*, being several inches wider than regular trains.

Enjoy this *sailing thrill* on your next trip between Houston and Dallas.

Northbound		*Southbound*	
Lv. HOUSTON	4:45 P.M.	Lv. DALLAS	5:00 P.M.
Ar. DALLAS	9:10 P.M.	Ar. HOUSTON	9:25 P.M.

Connections for Tulsa, other Oklahoma points, Kansas City, Colorado, Ft. Worth.

Connections for California, Corpus Christi, Rio Grande Valley, Beaumont, Lake Charles, New Orleans, East.

ROUND-TRIPS
IN CHAIR CARS
NOW MAY BE MADE
AT LESS COST
BETWEEN ALL S.P.
POINTS

SP unites the principal cities of Texas and Louisiana with fine, fast overnight and daylight trains.

Famed transcontinental service: *Sunset Limited* and *Argonaut*—New Orleans to California, via Lake Charles, Beaumont, Houston, San Antonio, El Paso.

Southern Pacific

J. T. Monroe, Passenger Traffic Manager,
Southern Pacific Bldg., Houston, Texas.

SHIP VIA S. P....FREE PICK-UP AND DELIVERY SERVICE

LOOKING AHEAD

WITH THE EDITOR

Annual Yearbook Number Takes Peep Into the Future

THE year 1939 was a significant one for the oil industry, and 1940 promises to be equally important. Therefore, a review of the past year and a quick look into the prospects for this year is of vital interest to all oil men. This is the "theme" of the Annual Yearbook-Forecast Number, to be published next week. We believe this will be the most interesting and valuable statistical and economic number yet published, and a book that many will desire to save as a permanent record. Weeks of strenuous effort have been spent in its preparation.

It will discuss such subjects as:

Consumption of petroleum and its products during 1939 compared with 1938, and what the economists expect during 1940; United States crude oil reserve trend and the outlook for the future; a discussion of stocks of crude and refined oils on hand, and the desirability or undesirability of inventory levels; a forecast of wells to be drilled in the United States during 1940; a survey of expenditures likely to be made during the year for drilling and pumping equipment.

The trend of deep drilling and outlook for 1940; the amount of footage drilled in the United States; prospects for drilling work abroad; world production and its trend; earnings and their outlook; number of producing wells by states in the United States; prospects for natural gas; discovery rates in the nation; legislative prospects, and many other topics.

In addition, the annual index of THE OIL WEEKLY covering 1939 will be published.

The OIL WEEKLY. Published every Monday. Entered as second-class mail matter December 23, 1916, at the post office at Houston, Texas, under act of March 3, 1879.

THE OIL WEEKLY

ENGINEERING « NEWS » STATISTICS

EDITORIAL STAFF
WARREN L. BAKER
Editor

J. KENT RIDLEY
Managing Editor

ASSOCIATE EDITORS
L. J. LOGAN — BRAD MILLS
WM. V. GROSS

DISTRICT EDITORS
B. F. LINZ.....Washington
BEN ALTMAN, FRANK TAYLOR.....Tulsa
H. H. KING.....Fort Worth
EARL S. POST.....San Antonio
R. W. BYRAM.....Austin
CHAS. LEYENDECKER, WM. H. STRANG, Z. H. MISCHKA.....Houston

PUBLISHED BY
THE GULF PUBLISHING COMPANY
HOUSTON, TEXAS

R. L. DUDLEY, *President*
A. L. BURNS, *General Manager*
S. W. ROBINSON, *Editorial Director*

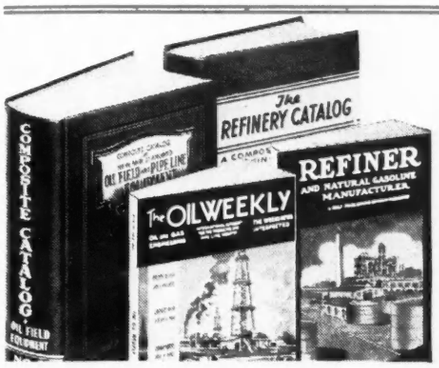
Staff correspondents at all important points.

Member Audit Bureau of Circulation
Member Associated Business Papers, Inc.

BRANCH OFFICES
NEW YORK.....250 Park Ave.
PITTSBURGH.....Vandergrift Bldg.
CHICAGO.....332 S. Michigan Ave.
LOS ANGELES..W. W. Wilson Bldg.
Huntington Park, Calif.
TULSA.....Hunt Bldg.
FORT WORTH.W. T. Waggoner Bldg.
SAN ANTONIO.....Smith Young Tower Bldg.
WASHINGTON.....Albee Bldg.

ADVERTISING STAFF
DICK SWINSKY.....New York
C. A. WARDLEY.....Pittsburgh
H. G. FITZPATRICK.....Chicago
J. F. CARTER, JR.....Tulsa
JAY CURTS, JR.....Los Angeles
CHAS. WYATT.....Houston

CIRCULATION DEPARTMENT
J. T. WAGONER.....Manager



SPECIALIZED OIL JOURNALS
Published by
THE GULF PUBLISHING COMPANY

The Oil Man's Calendar

FEB. 12–15	American Institute of Mining & Metallurgical Engineers, New York.
MAR. 14–15	American Petroleum Institute, Mid-Continent District, Division of Production, Wichita, Kansas.
19	American Petroleum Institute, Pacific Coast District, Division of Production, Los Angeles.
28–29	American Petroleum Institute, Southwestern District, Division of Production, Houston, Texas.
31	Western Petroleum Refiners Association, Wichita, Kansas.
APR. 10–12	American Association of Petroleum Geologists, Chicago.
11–12	American Petroleum Institute, Eastern District, Division of Production, Columbus, Ohio.
18–19	National Petroleum Association, Cleveland, Ohio.
26–27	Petroleum & Natural Gas Conference, State College, Pa.
MAY 1– 3	Petroleum Industry Electrical Association, Dallas, Texas.
15–17	Natural Gasoline Association of America, Tulsa.
18–25	International Petroleum Exposition & Congress, Tulsa.
27–31	American Petroleum Institute, Mid-Year Meeting, Ft. Worth, Tex.

Contents « January 22, 1940

Volume 96, Number 7

This Week's Panorama 11

Feature Section:

Paluxy, Pettit Discoveries Intensify Deep Search in East Texas 12
BY JOSEPH A. KORNFELD

Influence of Submergence and Fluid Level on Pumping Wells 16
BY HUSTON HUFFMAN

Portable Container Protects Pressure Gauge From Injury 15

Thirty-two Mile Line Replaced in Twenty Days 19

Mississippi Looms as Nation's Major 1940 Geophysical Play 20
BY D. JOHN D. TODD

News Section and News Index 35

Looking Ahead With the Editor 4

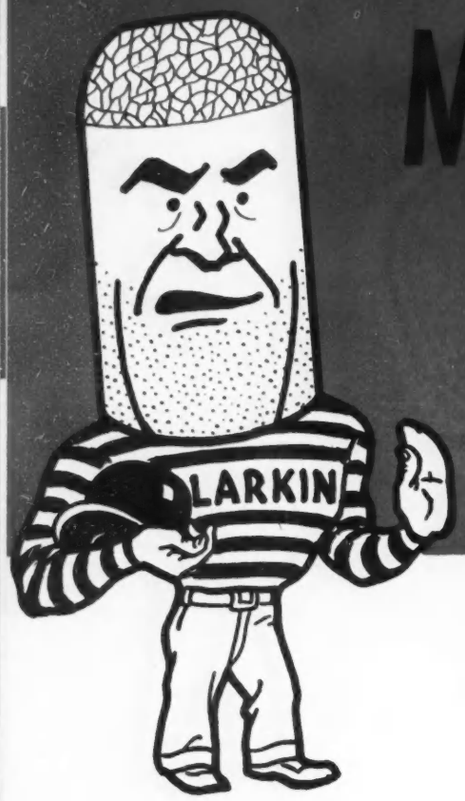
Notes for the Equipment Buyer and User 61

Squeaks From the Bull Wheel 65

Advertisers' Index 66

Published every Monday. Single Copies 15 cents (Special Issues 50c). Subscription price, domestic and foreign, $2.00 a year; 2 years $3.00. Entered as second-class mail matter December 23, 1916, at the post office at Houston, Texas, under act of March 3, 1879. Subscription restricted to those engaged in the producing and pipe line branches of the oil industry or the manufacturing and distribution of oil field supplies. Advertising rates on application.

Copyrighted 1940, by The Gulf Publishing Company.



MEET THE CHAMP!

LARKIN PACKER COMPANY'S PRIZE-WINNING FLOAT SHOE

HE'S HARD...HE'S TOUGH...HE'S NEVER YET BEEN LICKED ON A TOUGH JOB

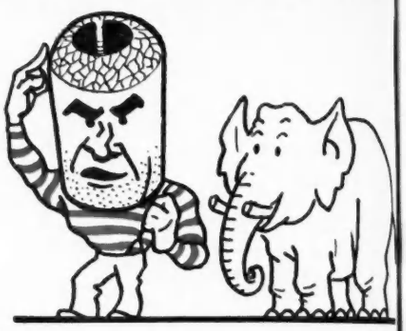
HE'S TOUGHER!

The bakelite guide has a tensile strength of 7,200 lbs. and a compressive strength of 36,000 lbs., which gives you a safety factor far above the maximum you'll ever need to take care of rough transportation, or obstacles encountered when guiding.

HE'S STRONGER!

Strong enough to stand up under 6,200 lbs. per square inch—by actual hydraulic tests—and that's plenty strong! With a resistance against back pressure like that, you can forget all worries about long heavy strings or cement leak-backs!

HE'S BIGGER!



Bigger because he's got 7 square inches of valve opening...75% greater than any other float shoe on the market. Big opening and a ground-perfectly-round Bakelite Ball operating in a precision-lapped seat, give you quick and thorough cementing, eliminate danger of clogging and plugging.

HE'S SHOCK-PROOF!

Transportation shocks and impacts, rough handling, and knocks received in service are easily absorbed by the fabric-bakelite guide that has more impact resistance than anything else we know of. Yet the bakelite guide and valve parts are easily pulverized by the drill and circulated out of the hole.

HE COMES FROM A TOUGH FAMILY, TOO!

The entire family of Larkin equipment has the same hardy characteristics . . . toughness, sturdiness and high strength without excess weight. That's because Larkin products are the result of long experience, extensive pioneering research, plus thorough knowledge of the practical problems of the field.

HERE'S A CLOSE-UP OF HIM ▶

General Offices:
6200 Maple Avenue
St. Louis, Mo.

LARKIN

Warehouse Points:
Tulsa, Okla; Great Bend, Kans; Salem, Ill; New York City; Houston, Corpus Christi and Odessa, Texas

LARKIN PACKER COMPANY ★ ST. LOUIS, MO.

THE OIL WEEKLY

JANUARY 22, 1940

VOLUME 96 NUMBER 7

The Week's Panorama

THE industry's outlook remains shadowed by the weakness of the gasoline market and the threat that the weakness may linger well into or through 1940.

Weather and Oil . . . . . .

Refiners continue unsuccessful in synchronizing their operations with the weather. Low temperatures over the country have sharply stimulated demand for heating oil; and despite drawing heavily on stocks, the industry has been obliged to step up refinery runs precipitately to keep oil burners supplied. The brisk fuel oil business is gratifying; but unfortunately, the large refinery runs that have been necessitated have forced further large additions to already burdensome gasoline stocks.

Crude Runs High . . . . . .

Crude oil production and runs to stills were both high in the week ended January 13. The country's wells put out about 20,000 barrels a day more than indicated average daily market requirements for January. And crude runs were boosted 150,000 barrels daily, to the highest level since October. The runs then were 9.6 percent larger than in the corresponding week a year ago.

Heating Oil . . . . . .

Despite increased output at the refineries, heating oil was consumed faster than it was made in the week of January 13, in reflection of cold weather, and storage was drawn upon by the relatively large amount of nearly 2,000,000 barrels.

Although heating oil demand has been running about 15 percent above the levels of a year ago, the stocks of that product now are 12.6 percent smaller than they were then. The national inventory of 30,326,000 barrels of gas oil and distillate fuel on hand January 13 compared with 34,705,000 barrels held a year previously.

Industrial Fuel . . . . . .

Decreased withdrawals lately from stocks of residual fuel oil have reflected flattening out of previously increasing industrial activity. Stocks have been diminishing about one half million barrels a week recently, whereas withdrawals of around a million barrels weekly occurred in December.

Demand for the heavy fuel oils has been running about 10 percent larger than a year ago, but stocks currently are 11 percent lower.

Surplus Gasoline . . . . . .

While cold weather has stimulated consumption of heating oil, it has appreciably retarded motoring and the use of gasoline, as evidenced by backing up of that product in storage.

After having increased only a normal amount of a million barrels in the previous week, gasoline stocks expanded twice that much in the week of January 13, although production at refineries during the period was only 265,000 barrels greater.

Whereas gasoline demand is only around 5 percent larger than a year ago, with exports lagging, stocks are up approximately 13 percent.

Even if additions to storage should be cut down to a million barrels a week, the inventory would reach 95,000,000 barrels by March 31; whereas economists say that 82,000,000 barrels would be adequate on entering the spring-summer period.

Aviation Gasoline . . . . . .

As air travel grows, so grows the consumption of aviation gasoline. Formerly an insignificant part of all gasoline consumption, the use of aviation gasoline gradually has assumed appreciable proportions.

According to figures of the Bureau of Mines, the total demand for aviation gasoline in November represented 1.4 percent of all gasoline demand. Exports of aviation gasoline constituted 10.7 percent of all gasoline exported.

Buses and Trucks . . . . . .

Contributing materially to the record consumption of gasoline in 1939 was the bus and trucking industry of the United States, which had an exceptionally good year, in consequence of the brisk industrial and business activity.

Trucking companies did a larger volume of business than ever before, as tonnage hauled was about 25 percent greater than in 1938.

Travel on the bus lines showed a further increase, having been stimulated by better business conditions and the two big fairs in New York and San Francisco.

Cole Committee . . . . . .

Proponents of the Cole bill for federal oil control probably were pleased with some of the testimony offered to the Cole congressional subcommittee at Los Angeles last week.

Governor Culbert Olson, who had endorsed the state oil conservation bill that failed by referendum last year, said he believed that both proponents and opponents of regulation were interested more from the standpoint of immediate profits than from that of conservation. He expressed doubt that any advocates of either federal or state control would approve the prevention of that kind of waste involved in shipping California oil to Japan and other countries for war use.

Paluxy, Pettit Discoveries Intensify Deep Search in East Texas

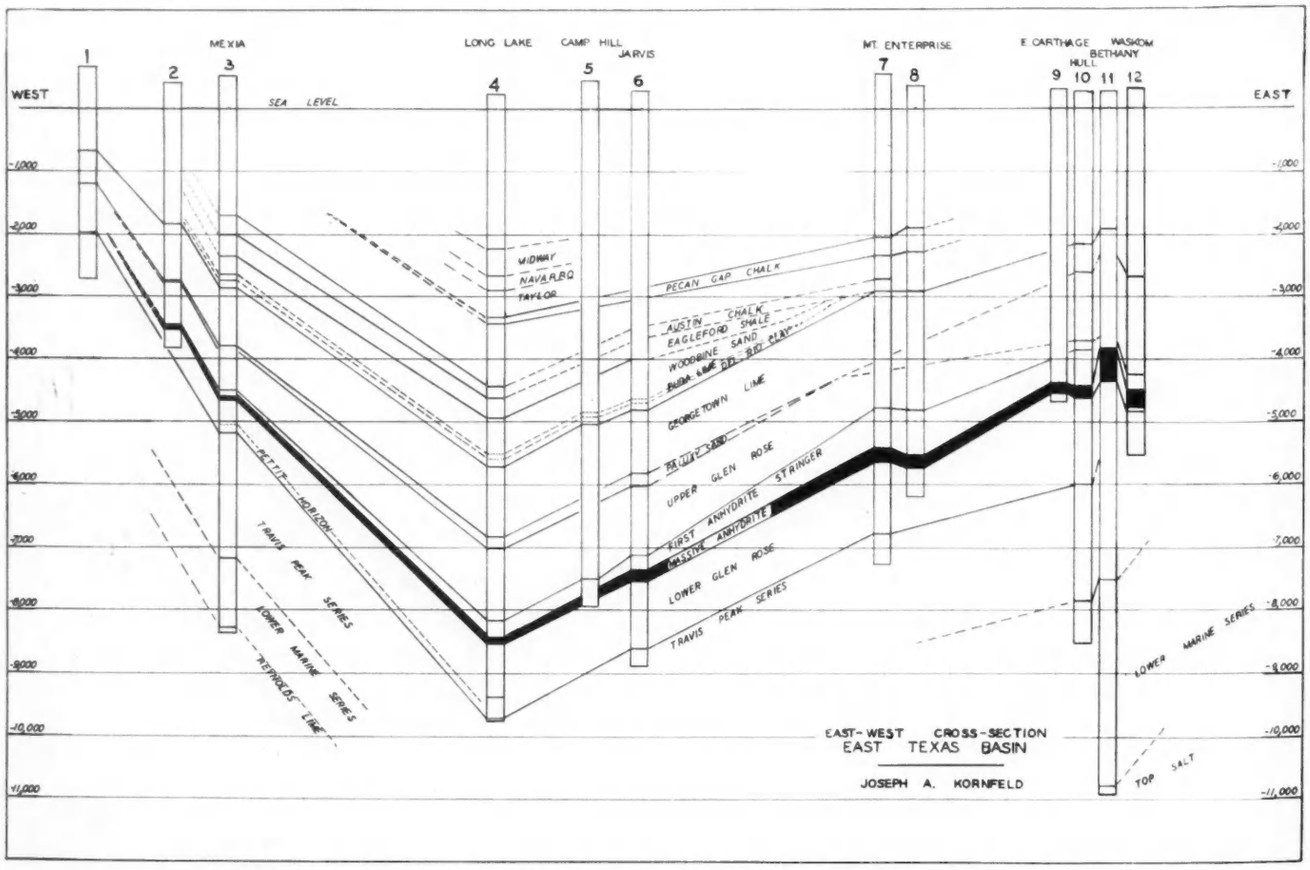
By JOSEPH A. KORNFELD, Consulting Geologist-Engineer,
Wichita, Kansas

RECENT successful discoveries of high-pressure gas in the Paluxy sand member and the Pettit oolitic lime zone of the Trinity formation has intensified search for production from the Trinity in many sectors of the East Texas basin.

The Paluxy sand gas discovery, recorded on the flank of the Chapel Hill (Basal Glen Rose) gas-distillate pool in eastern Smith County, marks the first production possibilities from that formation throughout the East Texas basin aside from the shallow asphaltic-base crude produced on the Balcones fault line in Hopkins, Franklin and Titus counties. The Chapel Hill flank strike is situated 65 miles south of the Sulphur Bluff and Talco Paluxy-sand pools and is 60 miles west of nearest Paluxy sand gas production in the Bethany field of Panola County, Texas. Other Paluxy production has been developed in North Louisiana in the De Soto-Red River field, at Pleasant Hill in Sabine Parish and in the Pullman pool of southeastern De Soto Parish; and in the Garland City pool of Miller County, Arkansas, where it is productive of 27- to 33-gravity (Baume) crude 65 feet below the top of the Lower Cretaceous formations.

Chapel Hill Paluxy Pay

The Paluxy-sand flank discovery well at Chapel Hill is situated 1½ miles northeast of the discovery gas well and is designated as Shell Oil Company's H. Campbell 1, in the northwest corner of the Phillip Lively Survey. It encountered Georgetown lime at 4392 feet (3943 feet subsea), had the Paluxy at 5533 feet (5084 feet subsea) and showed some gas pressure in drilling to 5821 feet, 288 feet in that forma-



East-West cross-section of the East Texas basin illustrating particularly the stratigraphy of the Trinity formation and the underlying lower Mesozoic formations; section is taken across the southern portion of the basin from Hill City to the Louisiana state boundary line.

tion. A drill-stem test was made from 5749 to 5821 feet, using ¼-inch chokes, top and bottom; opened 8 minutes, it gauged 15,000,000 cubic feet of gas, developing pressures up to 350 pounds. Structurally, it compares only 14 feet lower than the discovery well on the Georgetown lime marker, and but 1 foot higher on the Paluxy. It is being carried to deeper objectives.

The search for Paluxy sand production recalls that The Pure Oil Company's V. T. Davis 1, on the northwest flank at Van, in eastern Van Zandt County, recovered cores yielding gas bubbles and oil odor in Paluxy topped at 4729 feet or 4241 feet subsea; however, a drill-stem test from 4781 to 4840 feet indicated only salt water and mud.

Paluxy sand potentialities may be divided into three groups: (1) faulted structures, (2) deep-seated domes, and (3) stratigraphic traps, both local and regional.

Fault-line structures productive in the Paluxy include the Sulphur Bluff field of Hopkins County, the Talco field of Franklin and Titus counties, and the Garland City field of Miller County, Arkansas. Under this classification is included possibilities derived in connection with closure on the upthrown side of crestal faults intersecting local structures.

Deep-seated structural domes offer greatest possibilities in the East Texas basin, such as exemplified at Chapel Hill; structural relief in the Lower Cretaceous formations on the east limb of the East Texas basin may be expected to be found twice as great as that in the Upper Cretaceous formations, if the geologic history of the Sabine dome is taken as a criteria.

Stratigraphic traps, both local and regional, offer definite encouragement for Paluxy-sand exploration. Lenticularity of the sand is ascribed by L. R. McFarland* as controlling production in the Paluxy sand on the north and west sides of the Garland City pool of Miller County, Arkansas, although the structure (an elongated east-west nose) controls the south and west productive limits. Stratigraphic accumulation accounts in part for the heavy gas production on the northeast flank of the Chapel Hill pool of Smith County, since the sand section observed in the Shell-Campbell flank discovery "shaled up" in the original field discovery well. Occurrence of oil production in a stray lime between the anhydrite zones in the middle Glen Rose in a stratigraphic accumulation opened the Opelika field in northeastern Henderson County early in 1938. Stratigraphic accumulation in the Paluxy has been observed at Ferry Lake and Dixie in Caddo Parish and Pleasant Hill in Sabine Parish, Louisiana.

After a 13-year search for commercial production in the Trinity formation along the Mexia fault zone, gas production was developed during November at

Tentative Correlation Chart, Mesozoic System

NORTHEASTERN TEXAS

After B. W. Blanpied, Shreveport, Louisiana

Series	Group	Formation	Member
Gulfian	Navarro	Kemp Nacatoch Sand Neylandville	
	Taylor	Upper Taylor Wolf City Sand Taylor Clays	Pecan Gap tongue Annona Chalk tongue Gober Chalk tongue
	Austin Chalk	Bonham Clays	Gober Chalk tongue Brownstown marl (restricted) Blossom Sand Ector tongue
	Eagleford	Eagleford Shale Tarrant-Lewisville	
	Woodbine	Woodbine Sand	Dexter Sand
Comanchean	Washita	Buda Grayson Main Street Paw Paw Weno Denton Fort Worth Duck Creek	
	Fredericksburg	Kiamichi	
		Gatesville	Edwards Lime Comanche Peak Walnut Clay
	Trinity	Paluxy Sand	
		Upper Glen Rose	Anhydrite Stringer
		Glen Rose Anhydrite	
		L. Glen Rose	Anhydrite Stringer Rodessa Member James-Young Member Pine Island Member
		Travis Peak	
	Pre-Trinity	Cotton Valley	
		Buckner	
		Smackover Limestone	
		Eagle Mills Salt	

Wells Used in Section

The following is a summary of the well-log records and markers used in preparation of the east-west geologic cross-section of the East Texas basin:

1. Humble Oil & Refining Company's M. Holderman 1, Hill County, 3398 feet, in Travis Peak series, elevation 659 feet, abandoned.

2. P. S. Groginski et al's S. P. Love 1, Navarro County, 4225 feet, in Lower Glen Rose series, elevation 422 feet, abandoned.

3. The Pure Oil Company's W. B. Kendrick 16-T, 3 miles west of Mexia, Limestone County, total depth, 8847 feet, in Reynolds lime, elevation 520 feet, junked.

4. Tide Water Associated Oil Company's Monnig 7, Simon Sanchez Survey, Long Lake field, Anderson County, 9971 feet in Travis Peak series, elevation 233 feet, abandoned.

5. Gulf Oil Corporation's M. J. Ross 1, Camp Hill field, Anderson County, 8383 feet in Lower Glen Rose series, elevation 487 feet, abandoned.

6. Humble Oil & Refining Company's Southern Pine 1-C, Jarvis prospect, Anderson County, 9155 feet in Travis Peak series, elevation 339 feet, abandoned.

7. The Pure Oil Company's W. H. Faulkner 1, Mt. Enterprise prospect, Rusk County, 7799 feet, in Travis Peak series, elevation 563 feet, abandoned.

8. Barnett Petroleum Corporation's S. C. Sanford 1, William A. Corder Survey, Mt. Enterprise prospect, Rusk County, 6511 feet, in Lower Glen Rose series, elevation 361 feet, abandoned.

9. Smith & Turner's Bird 1, Gillespie Survey, East Carthage gas field, Panola County, 4997 feet in Lower Glen Rose series, elevation 279 feet, initial production 40,000,000 cubic feet gas daily.

10. Magnolia Petroleum Company's E. A. Hull 2, Thomas Applewhite Survey, Panola County, 8718 feet in Lower Marine series, elevation 232 feet, gas well.

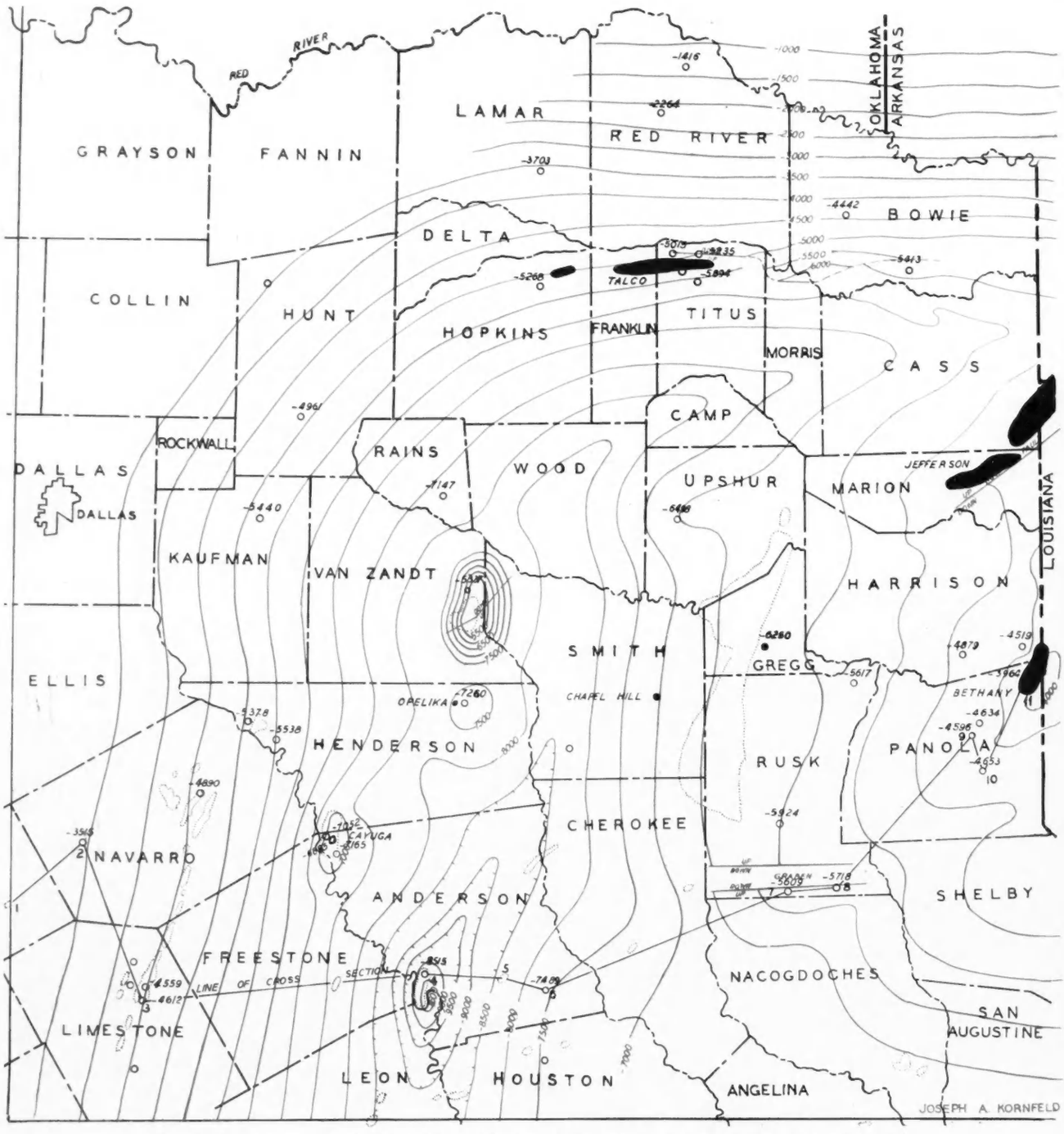
11. The Texas Company's Claude Adams 1, in the Thomas Cox Survey, Bethany gas field, Panola County, 303 feet in salt, elevation 287 feet, plug-back to test Lower Marine showings.

12. Arkansas Fuel Oil Company's Taylor 1, Holloway Survey, Waskom field, Harrison County, 4835 feet in Hill zone of Lower Glen Rose, elevation 313 feet.

* L. R. McFarland, Garland City Pool, Guide Book, Shreveport Geological Society, Fourteen Annual Field Trip, p. 123.

the Groesbeck segment of the fault zone. This discovery was made by Murray Samuell, Dallas, and S. J. Taylor, Tyler, Cannon Barron 1, in the W. C. McKenzie Survey, Abstract No. 7, 4 miles southwest of Groesbeck. Production is obtained from the Pettit zone, an oolitic lime zone in the Pine Island member of the lower part of the Lower Glen Rose member of the Trinity formation. Pay was obtained through casing perforations from three sets of shots (8 shots in each section) as follows: from 5584 to 5588 feet, from 5597 to 5603 feet, and from 5605 to 5611 feet; all in Pettit zone topped at 5591 feet. Initial official gauge was 5,575,000 cubic feet of gas with 5 barrels of water-white distillate per million cubic feet of gas production. Originally, the wildcat was drilled to 6029 feet in Travis Peak, topped at 5713 feet. Elevation is 448 feet.

The Pettit zone is productive of oil and gas in the Sligo field of Bossier Parish, and in the Lisbon field of Claiborne and Lincoln parishes. Other Pettit producing areas in the East Texas basin are situated in the Longview gas-distillate field of Gregg County, in the Waskom field of Harrison County. Its regional stratigraphic occurrence should mark this an important objective throughout the entire basin.



Regional structure of the East Texas Basin; structural contours represent the base of the massive anhydrite of the middle Glen Rose. Contour interval 500 feet.

Portable Container Protects Pressure Gauge from Injury

IT IS a well known fact that the mortality rate of pressure gauges around an oil field is usually quite high. Hard jolts, broken glasses and cases, twisted or broken stems and Bourdon tubes, exposure to wet weather—all contribute toward sending many gauges to the repair shop and possibly the scrap pile.

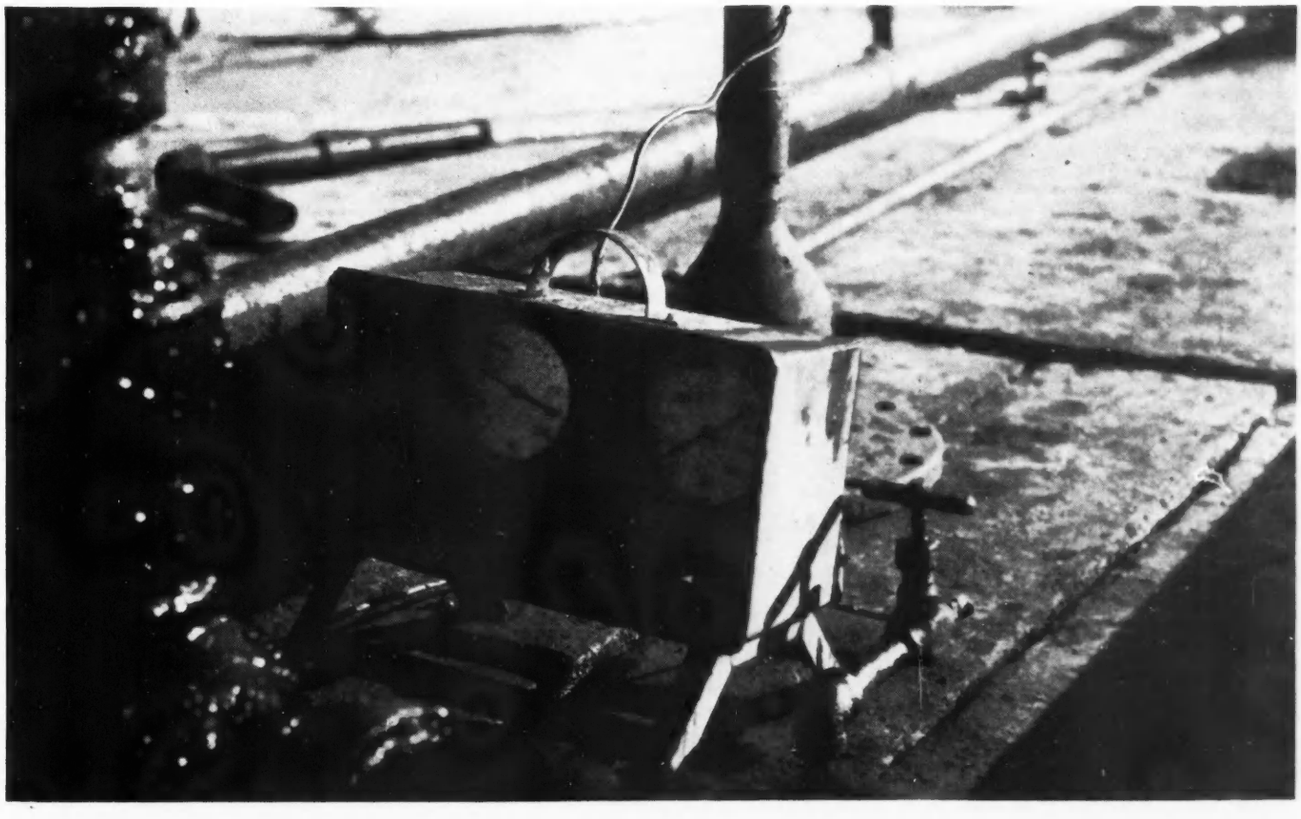
A company operating in one of the Southern California oil fields, realizing the large amount of money that is usually lost per year through rough handling of gauges —especially when several hundred gauges may be in service continually — constructed light galvanized sheet metal containers in which the gauges for each well can be permanently kept, yet easily moved if necessary.

As shown in the photograph, the box, resembling a small valise with the side open, stands upon simple angle-iron legs, and can be located at any convenient place on the derrick floor. The front legs are slightly longer than the rear ones so that it will tilt back, for easier view of the gauges. A small handle on the top facilitates moving it about. Instead of keeping the gauges fastened to the well head and fittings, which are very often below the floor and difficult to get at, short lengths of small copper tubing are used as risers, and are connected to a small manifold of ¼-inch tees and needle valves mounted on the back of the container, and to which, in turn, are connected the gauges by means of ¼-inch unions.

On the particular well shown in the photograph it was more convenient to use small pipe as risers from below the floor, but by using the copper tubing, it was not necessary to make up a rigid floor mounting. Extra fittings on the back of the small manifold also make it possible to attach a recording gauge when special tests on the well are necessary.

When the well is to be worked on, it is only necessary to close off and disconnect the fittings from the well, and the entire asembly can be carried off to one side where the gauges will be safe from breakage and harmful splashes of water and crude oil.

Needless to say, these gauges read correctly for a much longer time, and the small cost of the construction of the container is more than offset by the prolonged life of the gauges.



Influence of Submergence And Fluid Level on Pumping Wells

Pumping Series Article No. 34

By HUSTON HUFFMAN

IN any pumping well there are four factors which determine the amount of fluid which will be produced. These are: (1) the fluid level maintained in the casing, (2) the submergence of the standing valve, (3) the displacement of the pump, and (4) the reservoir pressure. Since the displacement of the pump is a purely mechanical problem, and the reservoir pressure a force beyond control, this article will be directed principally to a study of the effects of submergence and fluid level, and the considerations involved in establishing them.

By submergence is meant the actual distance the standing valve is below the surface of the fluid in the casing. And by the fluid level is meant the distance from the bottom of the well to the top of the fluid. This may vary from a few feet in the case of a stripper well to as much as a thousand or more feet in large wells. Depending on the position of the pump it is possible to have a high submergence with a high fluid level, a low submergence with a high fluid level, but with a low fluid level only a low degree of submergence is possible. It must be remembered that the terms high and low submergence and fluid level are relative expressions. What might be a high fluid level for one well, would be low for another.

There are two opposing forces, the balance of which determines the quantity of oil that will enter a well. They are (1) the reservoir pressure which is forcing oil into the well, and (2) the bottom-hole pressure which is the pressure on the sand face resisting the entrance of oil and gas. This latter pressure is in reality the sum of three forces: (1) the casing head pressure, (2) the weight of the gas on the surface of the fluid, and (3) the static head of oil in the casing. It is obvious, then, that any reduction in the opposing or bottom-hole pressure will result in a greater influx of oil. Therefore, to obtain the maximum production from a given well, and lacking other considerations, it is to the interest of the operator to keep both the fluid level and the casing head pressure at a minimum. That there are other considerations will be shown later.

The static head of fluid in the common sucker rod type of well is reduced by pumping, and since the suction effect developed by the ascending plunger is negligible, due to compressed gas or gas coming out of solution, the real motivating force in driving oil into the pump barrel is the pressure of the fluid on the underside of the standing valve. This pressure, of course, varies directly with the submergence; an increase of which makes for a faster valve action and a more complete filling of the pump. The most obvious means of increasing the submergence is to lower the tubing, and at the same time maintain the previous fluid level. Therefore, from the point of pump efficiency it is to the interest of the operator to maintain the static head at a maximum, because only by so doing can he achieve the greatest possible submergence. It already has been pointed out, however, that the higher the fluid level or opposing force, the less will be the amount of incoming oil. So if the operator is interested in procuring the greatest possible production, he cannot disregard the efficiency of the mechanism by which he obtains that production, and conversely to achieve the maximum mechanical efficiency at the expense of production would be uneconomic. Hence, a mean must be struck between these two complementary extremes.

A low fluid level or high differential pressure keeps a minimum back pressure on the sand face; but from the standpoint of ultimate recovery this may not be desirable. Failing to keep a back pressure on the sand of a high gas-oil ratio well will often permit gas to escape without doing useful work in forcing the oil into the hole. Gas moves more easily through sand than oil and unless this gas is slowed down by back pressuring, slippage and channeling will occur. Furthermore, if a section containing gas is overlying the oil bearing portion of the formation, the exposal of or pressure reduction on the face of this section

will permit quantities of free gas to escape. In addition to wasting energy which should be employed in moving oil into the hole, this condition may aggravate gas-lock conditions in the pump. In short, the same arguments for back pressuring exist in this type of well as in the case of flowing wells.

Another advantage of the high fluid level is that it keeps the face of the sand covered at all times. If the sand face were uncovered, the pores would become clogged with a paraffin deposition. This, of course, retards the entrance of oil; so it is more desirable wherever possible to keep the fluid level above the top of the sand. In stripper wells and wells having a very low bottom-hole pressure this cannot be done. In stripper wells the drainage is largely by gravitational seepage, so the pump should be set as near bottom as possible. Sometimes, where formation characteristics permit, it is possible to gain additional submergence by drilling a sump hole beneath the oil formation. Gas trouble in wells of this kind is practically non-existant, so the formality of a gas anchor should be omitted. A short two-foot nipple perforated and plugged should prove ample insurance against the entrance of mud.

In attempting to arrive at the optimum fluid level for a well, the question of sand intrusion is also one of primary importance. Where the formation is loose and unconsolidated, large quantities of sand will be produced with the oil. Caving will occur also. In this respect, Oklahoma City has probably been one of the worst fields. Some of its flowing wells produced as much as 15 percent sand. In such a field, sand continues to be a trouble-maker for the duration of its life. One method that frequently has proved helpful in combating sand trouble is a relatively high fluid level. The pressure of the fluid against the walls not only tends to reduce the caving, but since the carrying capacity of the incoming fluid varies as the square of its velocity, less sand will be carried into the well than if no back pressure were held. When necessary, a high fluid level also permits the pump to be set high and the oil skimmed at intervals. Thus, the sand is allowed to settle during the time the well is shut down.

The control of water is another point of paramount importance in the establishment of a fluid level. Most authorities agree that rapid production of a well encourages the intrusion of water, and that maintenance of a suitable back pressure will delay the ultimate entrance of this water. This is especially evident where high-speed potentials are taken. The first appearance of water often occurs after such a test. Unremitting swabbing has the same effect. But in cases where a well is already making large amounts of bottom water, it is necessary to prevent the penetration of the oil formation by this water. Once an oil sand becomes thoroughly wetted with water a condition unfavorable to the flow of oil through that formation is created. Under such conditions, a well should be pumped at a rate and depth which will keep the water from penetrating the oil formation. Some wells do not react in this way, however, and by permitting a high fluid level, the oil can be skimmed off the top of the fluid.

So far we have seen the advantages and disadvantages of the high and low fluid levels in their relation to the reservoir. In general, the high fluid level produces the well under sounder and more economic conditions, but at the same time it is reducing the rate of production by the pressure it exerts on the sand. The low fluid level will generally produce a correspondingly greater amount of oil. By means of the productivity index, or barrels per day per pound of drawdown, this is readily understandable. For example, if a well has an index of 3 barrels a day, a lowering of the fluid level by 20 feet will have the following effect: 3 (prod. index) times 30 (wt of 100 ft. of oil) times 20/100 = 18 barrels.

The well's production theoretically will be raised 18 barrels. The reduction of submergence resulting from this lowering, however, may so reduce the pump efficiency that instead of producing more it may actually put out less oil. Or else, by getting below the froth, the pump may produce more than the expected amount.

When due consideration is given to the numerous factors involved in the determination of the best fluid level, it can be seen why the production of two or more horizons through one well does not allow the most scientific means of production. For example, the top sand may have quantities of free gas and at the same time give sand trouble. The bottom formation might have a very low reservoir pressure. Accordingly, the sand face of the top formation should have a back pressure kept on it, but this would entail an even greater pressure, depending on the distance between the two, on the low pressure lower sand. Thus, the efficient production of one or the other would have to be sacrificed.

Submergence

As the reservoir pressure of a well declines, submergence, through its effect on valve action, becomes increasingly important. The quickness with which the standing valve opens at the start of the upstroke depends on the pressure on its underside. This pressure is a function of the submergence. Uren, Collins and Sargent, Figure 1, have shown how the efficiency of a pump varies with its submergence. To achieve maximum volumetric efficiency this valve should open the instant the plunger starts up, but preventing this instantaneous opening is compressed gas between the two valves and a certain amount of fluid, depending upon the clearance. This gas must expand

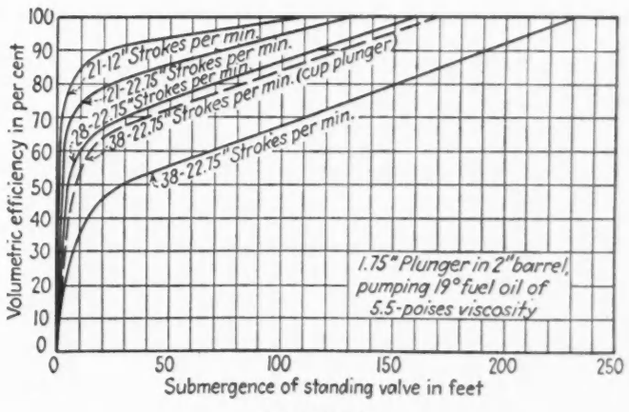


FIGURE 1

Variation of volumetric efficiency of a 2-inch plunger pump with submergence.

(After Uren, Sargent and Collins, American Institute of Mining and Metallurgical Engineers).

to a pressure approximating that of the static head before the valve will raise. Then the fluid already in the barrel must be accelerated by the inrushing oil. Gas as a factor in valve action has been discussed in a previous article, so its effect will be dealt with only as a constant force that must be overcome. If the submergence is 100 feet, the pressure on the underside of the standing valve, disregarding any additional casing head pressure, will be around 30 pounds, depending on the amount of gas mixed with the oil. When the gas between the valves has expanded on the upstroke to 30 pounds, the valve will open. Before this occurs, however, a large portion of the stroke may have been consumed. If this pressure on the underside can be increased by greater submergence to, say, 50 pounds, it is obvious that the expansion necessary to permit the valve to open will be reached at a lower point in the stroke; and the barrel will have that much more time to fill. In this example, the plunger would travel only three fifths as far as in the first case. This direct variance, however, will not hold under practical conditions, due to the fact that the density of the oil will usually increase with depth.

In the same way, at the top of the stroke the gas present in the pump is at a pressure equal to the static head. The greater this pressure, the fewer number of times will the gas have to be compressed before the descending traveling valve opens. This will reduce the severity of the "pound" on the rods.

It frequently happens that when the number of strokes per minute is increased, the actual increase in production does not correspond to the theoretical increase based on calculations of plunger displacement. To explain this, it must be assumed that the barrel is not filling up as much on the faster stroke. For example, if a well is making 150 barrels a day and it is know that the well is capable of producing twice that amount, it would be a fair assumption to suppose that raising the stroke from 10 to 20 would double the production. That the production is not doubled is due to the loss of pump efficiency at the faster stroke and the loss of plunger stroke due to the additional rod and tubing stretch. When a well is speeded up the fluid level is lowered to a new point of equilibrium. There is then less pressure to open the standing valve and less pressure to overcome the frictional resistance of the pump opening. This friction increases with the speed. Figure 2 shows the loss of efficiency under fast stroke conditions. At a slow stroke, a pump may fill completely up, but as the coefficient of friction becomes greater due to the faster entrance velocity of the fluid, there is a correspondingly larger pressure drop. Any method by which this pessure loss can be reduced will increase the efficiency of the pump. Over size standing valves and multiple tubing valves are means of doing this.

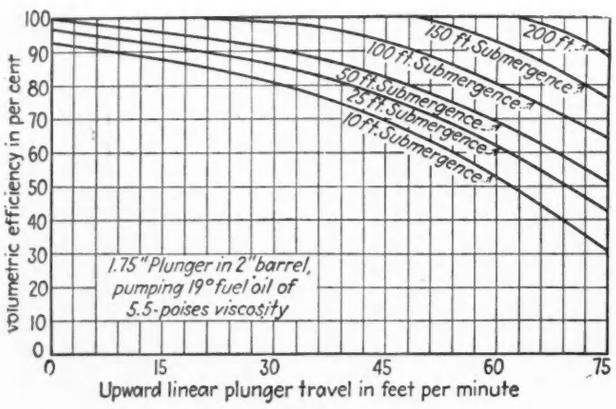


FIGURE 2

Variation of volumetric efficiency with rate of plunger travel for varying submergence.

(After Uren, Sargent and Collins, American Institute of Mining and Metallurgical Engineers).

It is evident that any increase in pumping speed must be accompanied by an increase in submergence in order to obtain the same degree of efficiency. Therefore, wherever possible, the desired increase in displacement should be achieved by a lengthening of the stroke, which will permit of a slower speed. Heavy, viscous oils especially demand a slow, long stroke, one that wll give the slow moving fluid ample time to fill the barrel.

The use of the inverted pump, in which the plunger is stationary and the barrel reciprocates on the end of the rods, is often advocated for sandy wells. The fact that the standing valve must be placed on the top of the plunger reduces the submergence by the length of the plunger. This distance may be unimportant in a high fluid level well, but where there is a low fluid level this three or four feet may be a relatively large portion of the total submergence. There are cases in which the production of low pressure wells has been increased several barrels by converting the inverted pump to the standard type.

In wells having low bottom-hole pressures, submergence is at a premium, and careful consideration to the construction of the gas anchor can often effect an increase in the submergence. When wells are first put on the pump, there is usually present with the oil produced a large amount of gas. This gas necessitates the employment of a long gas anchor. The usual arrangement consists of a perforated tubing nipple six or eight feet long. Below this is a mud anchor of anywhere from ten to thirty feet in length. The gas anchor or mosquito bill extends from the bottom of the standing valve about eight feet into the mud anchor. Such an arrangement probably places the pump no closer than 25 or 30 feet to the bottom of the hole. This provides ample submergence during the early pumping stages, but after the well declines in gas output, there is no longer need for such an elaborate anchor construction. Submergence becomes of increasing importance. Many operators, however, will fail to recognize this and leave the original long anchor intact for several years after its usefulness is past. Or else, they may wait until there is an occasion to pull the tubing, which may be a year or more. The added production resulting from the increased submergence would pay many times over for the expense of pulling rods and tubing.

Furthermore, a lengthy string of perforations is unnecessary. Roughly, the combined area of the perforations should be four times greater than that of the standing valve opening.

These, then, are the numerous factors which should be considered in determining the level at which to set a pump, the rate at which to pump it, and the fluid level to maintain. In any case, however, it is up to the operator to determine for each well what practices are the most economic.

Thirty-Two Mile Line Replaced in Twenty Days

STRIPPING an old pipe line, cleaning the ditch and laying an entirely new 32-mile transportation artery within three weeks is the story of Shell Pipe Line Company's activities in Archer and Clay Counties, Texas, following an explosion that rendered the system unfit for further service.

After a few days consumed by inspections, machinery was set in motion to lay an entire new section, using 31.20 pound A.P.I. seamless 10-inch pipe. Using bull-dozers, ditchers and tractors with side boom connections, the old line was ripped from the ground and dragged out of the way. The new pipe was strung along the right-of-way immediately, and several crews of welders began to stovepipe the new line. Weather conditions were excellent during the major portion of the construction period, and the ground was dry so trucks encountered no difficulty in crossing wheat fields and newly plowed terrain.

The route of the pipe line was over comparatively level ground which was of great assistance in speeding construction. However, several railroads and paved highways were crossed with deeply buried casing. Where this conduit was serviceable, the old pipe was pulled out and new lengths of pipe inserted.

The double joints of the new pipe was rolled above the old ditch, from which the damaged line was taken, and placed on conventional skids. A boom equipped tractor shifted the joints so the beveled ends of the pipe would match each other. A light pick-up truck carrying an electric welding unit followed the tractor and as the ends were leveled up, the welders applied the clamps and tacked the joints together. Moving with the precision of a well trained football team, the small truck and the tractor passed down the line with surprising rapidity.

A larger truck with a double unit of gasoline engine driven welding machines followed closely in the wake of the first and a group of welders completed the joints. Each welder, as he finished laying on the bead, marked the joint with the initial or numeral assigned to him, so that, when a test coupon removed at the discretion of the inspector showed a fault, the person responsible could be contacted easily. In passing, however, it was said that no test was taken but that showed that the weld was as strong as the pipe itself and no discredit was thrown upon any of the workmen handling the arc welders.

On the greater portion of the right-of-way, the soil indicated low corrosivity, low enough that the pipe was lowered into the ditch with no other protection than that afforded by the mill enamel and scale left on the pipe when preparing for shipment. Short stretches near draws and creeks indicated that protection of greater resistivity must be applied. At these points, the pipe was painted, wrapped and painted again with a bituminous enamel, then covered with the soil. All the approved methods of determining soil corrosivity were employed in the survey of this line, and the corrosion engineer had his report filed before the line was begun. Extremely hot spots, such as that covered between Texas state highway 66 and the pump station a mile or so west, were recommended for cathodic application for preventing outside damage from the soil.

As the dead line was set for January 3, 1940, for construction to be completed, and oil passing through the pipe, every effort was made to tie in the system in double quick time. At 4:00 p. m., January 1, the pump stations were kicked over and oil began to flow. Time consumed amounted to 20 days after the explosion.

Construction scene during the replacing of Shell Pipe Line Company's system in Archer and Clay counties, North Texas.

—Photo courtesy Geophysical Service, Inc.

Modern streamlined geophysical crew, of type used in Mississippi, effects economy both in men and equipment; permitting greater volume of geophysical data for less money by using only eight men and five trucks.

Mississippi Looms As Nation's Major 1940 Geophysical Play

By DR. JOHN D. TODD*

Part 2

As previously mentioned [The Oil Weekly, January 15, 1940] the surface mapping of the State of Mississippi, which resulted in the location of the Tinsley oil field and the other reported structures, was a part of a mineral industrialization program sponsored by the Mississippi State Geological Survey. The expense of this program was born in part by the federal government, in part by the State of Mississippi, and in part by the various counties in which the work has been done.

Credit for having secured the federal funds and piloted the project to its early fruition goes to Dr. William Clifford Morse. Dr. Morse's perseverance enabled the survey to secure a federal grant of $106,193.00 for the purpose of making a geological survey of a part of the state in search of non-metallic mineral resources; but this grant was conditioned with the stipulation that the survey must contribute $12,768.00 toward the work. Dr. Morse's confidence in the natural resources of the state was so great as to enable him to persuade the to-be-benefited counties to raise $9,128.00, after the state had declined to contribute more than $3,640.00 to the project. (It actually only cost the State of Mississippi $5.00 a day for two years to have the Tinsley oil field found, an all time bargain; particularly when it is considered that the tax revenue from the field even now, is more than that each hour of the day).

The counties which contributed to the expense of this geological survey (and thus were in part responsible for the first commercial oil production in the Southeastern States) and in which the mineral surveys have been completed are: Winston, Yazoo, Warren, Tippah, Union, Lauderdale and Forrest; and surveys have been started but are not yet completed in Adams and Tallahatchie counties.

Much excellent work has been done and is being done by all of the State Geological Surveys; but it is believed that Tinsley Dome is the first structure ever mapped by a state survey and recommended as a petroleum prospect, which later became an oil field. In any event, it is a certainty that no other structure mapped by any survey was ever so speedily developed. Tinsley Dome was determined to be a favorable structural area in February of 1939, and was so reported to the press in April of 1939; seven months from the time it was discovered, and five months from the time it was reported, an oil well was flowing into the tanks on the reported structure.

Tinsley Dome is producing oil, because when F. F. Mellen, Assistant State Geologist, walked along the course of Perry Creek almost a year ago, he noticed beds in the bank of the creek which he recognized to be the Moodys Branch Marl beds. He recognized this as being an Inlier (older beds completely surrounded by younger beds) and from his study he knew that the Moodys Branch Marl

*Roper & Todd, Consulting Geologists, 527 Esperson Building, Houston, Texas, 609 Tower Building, Jackson, Mississippi.

should not be on the top of the ground in that area. He knew that the Yazoo clays should be on the top of the ground, and that the Moodys Branch Marl should there be buried 200 to 300 feet deep. From this he was forced to conclude that the Moodys Branch Marl had been pushed up to its present high position by some elevation subsequent to its deposition, and that such displacement was evidence of structural uplift in the area.

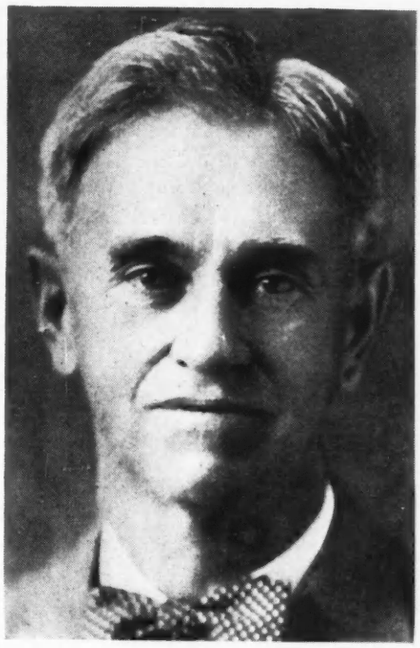
The area also was checked on the ground by V. M. Foster, a member of the survey staff, and the laboratory of the survey ran the paleontology of the exposed bed and confirmed the determination by paleontology as Moodys Branch Marl. The scientific courage of Mellen and Foster is to be admired, when it is considered that they recommended the Tinsley area in writing after it had been condemned geologically and geophysically by a large and highly successful oil company. They were pioneers who believed in what they knew, not what they heard; and as time has shown they were right.

Much of the success of Dr. Morse's program is due to the splendid support that he has received from the staff of the survey. Both Mellen and Foster were honor graduates from the geology department of the University of Mississppi, and both have been proteges of Dr. Morse for several years. The high caliber of the work done by the survey is evidenced by the way the Tinsley field is developing in conformity to the structural evidence reported by the survey. Figure 5 shows the data as reported by the survey, and the present location of the oil wells at Tinsley.

The present program of the survey calls for the mineral surveying of 10 or 12 additional counties within the next biennium, where local funds are already available to support such projects. Just how extensive the program is to be will, of course, depend on funds.

Geophysics Moves In

Now that Mississippi has been proved as an oil-producing state, the area engages the attention of the entire oil industry. It is hard



DR. WILLIAM C. MORSE
Director of Mississippi Geological Survey.

for a geologist to make an oil company believe that "there *must* be an oil field in this state" but it is not so hard for him to convince his company that "there must be *another* oil field in this state." It is just this change of status which is enabling geologists, who always believed in the possibilities of Mississippi, to find support within their organizations for a program in the area.

It is the old story of the far-sighted pioneer proving up condemned territory, and then the uninspired, methodical search of the industrialist finding many more oil fields in the same area. In other areas, the oil industry thus set in motion has always found other oil fields—and frequently better oil fields than the original discovery.

Without question, the present intense search of Mississippi will result in the finding of a very high percentage of whatever oil pools do exist under the state. Since this intensive search comes at a time when geophysics has become the accepted technique of exploration for the oil industry, the exploration of Mississippi will be largely by geophysics.

It is true that some of the companies are sending their surface geologists into Mississippi, but their number is negligible compared with the geophysical personnel in the area. While all geophysical work is expensive when compared with surface geology, still it is very cheap when compared to total exploration costs. And geophysics does offer certain definite advantages over surface work, no matter how expertly done, and over any other prospecting method now available for use in Mississippi.

Geophysical instruments get good results in the alluvial-covered portions of the state, where there are no exposed contacts to work with. With geophysics it is possible to find deeply-buried structures, which have had no late growth and have not deformed the more recent beds; and there are probably many more such structures than there are those having surface

Frederick Francis Mellen, assistant state geologist of Mississippi, at location of Moody Branch Marl Inlier, which led him to discovery of Tinsley Dome in February, 1939.

expression. Through geophysics we are able to accurately outline a structure, and to determine its shape and extent at the producing level. In fact geophysics offers the only available method for obtaining any dependable subsurface data in advance of the drill.

A brief consideration of the more popular geophysical methods now in use in Mississippi, with some notice of their theory and possibilities, will be attempted for those not fully acquainted with the present state of the geophysical science.

The Magnetic Method

The use of magnetics is as old as any of the geophysical methods, and like all of them has been yearly improving both as to the accuracy of the data obtained with the magnetometer and as to the acquired skill in interpreting the results.

The magnetometer measures the vertical magnetic pull of the earth; not the pull which makes the compass needle point north (that is the horizontal pull) but the magnetic pull toward the center of the earth. This vertical magnetivity varies greatly from place to place; most of the larger variations are due to influences from the basement complex, but smaller variations are now known to be caused by influences within the sedimentary section. That the sedimentary column does have a magnetic field has been adequately demonstrated by a core orientation service which makes use of the magnetivity of sediments. Operating upon remnant magnetism within the core sample, it is possible to determine which side of the core was originally north and which side south.

Since the basement complex is highly magnetic, it is possible through the use of the magnetometer to get very definite ideas of the configuration of the basement rocks in any area. In this manner, it will be possible in Mississippi, through the use of magnetic data and modern interpretation, to avoid wells drilling into basement material at shallow depths; as has recently been encountered in wells in Georgia and Colorado. By determining the proximity of basement material, the magnetometer gives some of the best data obtainable as to the thickness of the sedimentary section in an area.

FIGURE 7
(Opposite page)

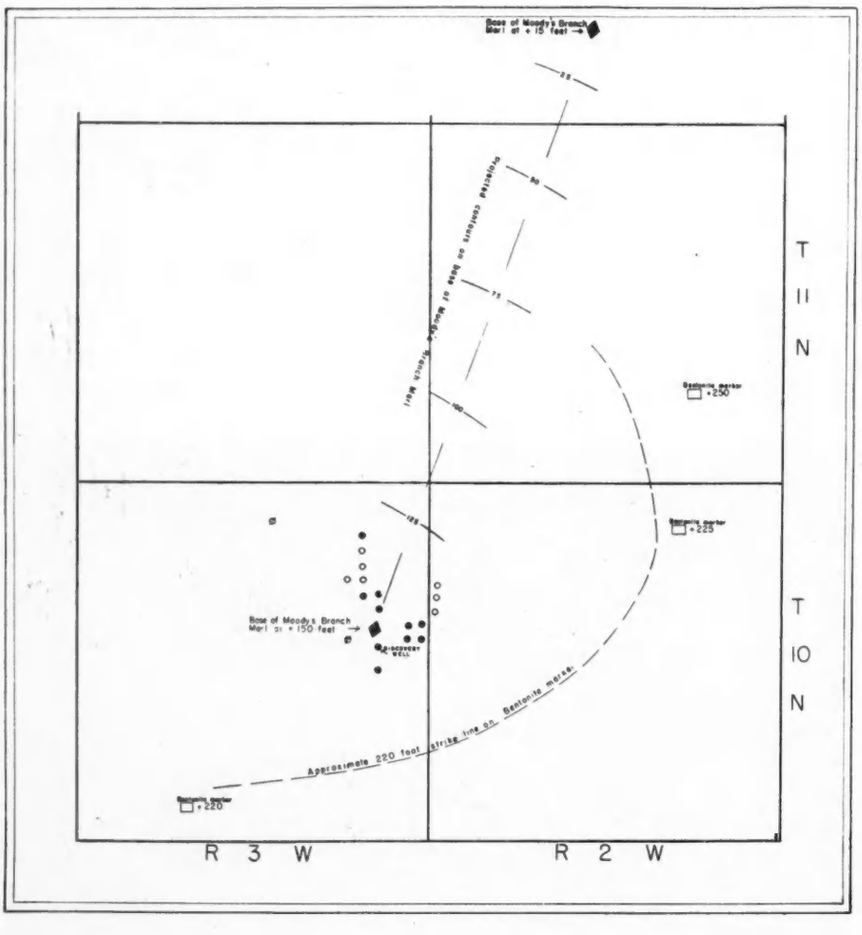
The magnetic anomalies due to proximity of igneous material are very large in area and of the order of hundreds of gammas. Thus the magnetic anomaly of the Jackson Uplift has 1000 gammas of closure centering south of the city limits; this very definitely indicates the igneous origin of the great uplift, and this has been confirmed by the encountering of igneous materials in the wells drilled there. Some of the anomalies in Sharkey and Washington counties, on which wells have drilled into igneous materials, have 600 gammas of closure. Under modern postulates of interpretation, nothing but shallow igneous material could be expected on a huge magnetic high of 600 gammas of closure; and wells in search of oil would not now be drilled on the top of any such picture.

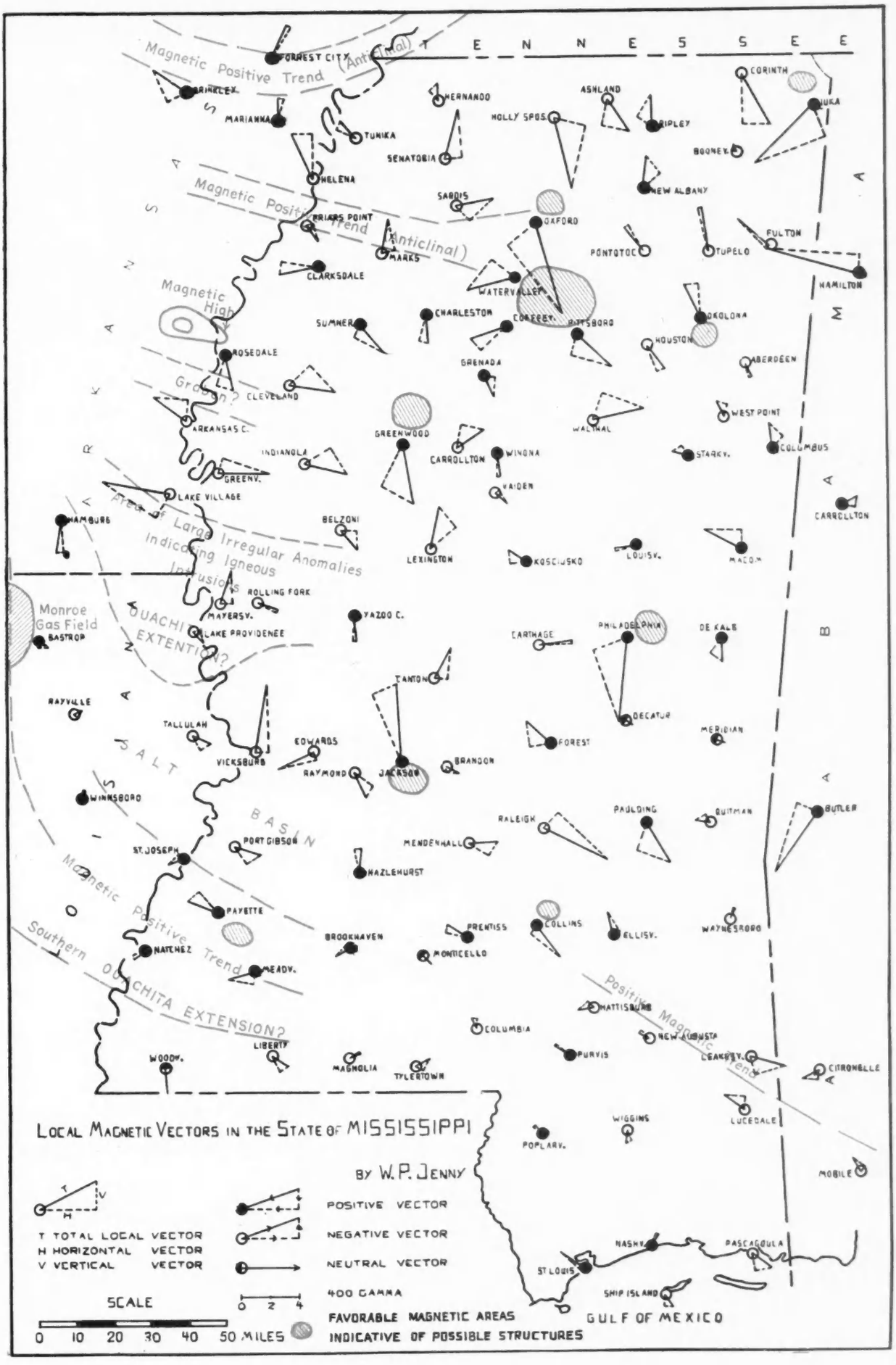
In regionally quiet areas, such as constitute the greater portion of Mississippi, we now prefer small magnetic closures of the order of 15 to 25 gammas; since it is now believed that these small distinct anomalies are due to influences within the sedimentary column. Such anomalies are usually gravity highs in Mississippi, due to some magnetic bed being pushed up closer to the instrument; however, in some cases they may be lows, due to thinning in deposition of a magnetic bed across the top of the structure, or to denudation of magnetic material from the top of the structure. The Edwards Salt Dome shows up as a distinct magnetic low, see Figure 6, due in part to the absence of magnetic materials over the dome and in part to the negative magnetic effect of the salt, which is there quite close to the top of the ground. Magnetics there predict that the greater portion of the salt mass will be found north and east of the salt well.

The magnetometer has also been used for locating faults, by measuring the displacement of the magnetic bed up or down in terms of gammas. This displacement causes a sudden jump in the magnetic

FIGURE 5

Tinsley area showing Mississippi State Geological Survey discovery data.


Base of Moody's Branch Marl at +15 feet
Base of Moody's Branch Marl at +150 feet
Discovery Well
Approximate 220 foot strike line on Selma marl
T 11 N
T 10 N
R 3 W
R 2 W


Magnetic Positive Trend (Anticlinal)
Magnetic Positive Trend (Anticlinal)
Magnetic High
Gradient?
Area of Large Irregular Anomalies Indicating Igneous Intrusions
Monroe Gas Field
OUACHITA EXTENTION?
Magnetic positive Trend
Southern OUACHITA EXTENSION?
Positive Magnetic Trend
SALT BASIN
FOREST CITY
HELENA
TUNICA
HERNANDO
SENATOBIA
HOLLY SPGS.
ASHLAND
RIPLEY
CORINTH
BOONEV.
NEW ALBANY
SARDIS
OXFORD
PONTOTOC
TUPELO
FULTON
HAMILTON
CLARKSDALE
WATERVALLEY
CHARLESTON
SUMNER
COFFEEV.
PITTSBORO
OKOLONA
HOUSTON
ABERDEEN
ROSEDALE
GRENADA
CLEVELAND
ARKANSAS C.
WEST POINT
WALNAL
GREENWOOD
CARROLLTON
WINONA
INDIANOLA
STARKV.
COLUMBUS
GREENV.
VAIDEN
LAKE VILLAGE
HAMBURG
BELZONI
LEXINGTON
KOSCIUSKO
LOUISV.
MACON
CARROLLTON
ROLLING FORK
MAYERSV.
YAZOO C.
LAKE PROVIDENEE
BASTROP
CARTHAGE
PHILADELPHIA
DE KALB
CANTON
DECATUR
RAYVILLE
TALLULAH
FOREST
MERIDIAN
EDWARDS
VICKSBURG
RAYMOND
JACKSON
BRANDON
WINNSBORO
RALEIGH
PAULDING
QUITMAN
BUTLER
PORT GIBSON
MENDENHALL
ST. JOSEPH
HAZLEHURST
PAYETTE
BROOKHAVEN
PRENTISS
COLLINS
ELLISV.
WAYNESBORO
NATCHEZ
MEADV.
MONTICELLO
MATTISBURG
COLUMBIA
NEW AUGUSTA
LEAKESV.
CITRONELLE
WOODV.
LIBERTY
MAGNOLIA
TYLERTOWN
PURVIS
WIGGINS
LUCEDALE
POPLARV.
MOBILE
NASHV.
PASCAGOULA
ST LOUIS
SHIP ISLAND
GULF OF MEXICO
LOCAL MAGNETIC VECTORS IN THE STATE OF MISSISSIPPI
BY W. P. JENNY
T TOTAL LOCAL VECTOR
H HORIZONTAL VECTOR
V VERTICAL VECTOR
POSITIVE VECTOR
NEGATIVE VECTOR
NEUTRAL VECTOR
400 GAMMA
SCALE
0 10 20 30 40 50 MILES
FAVORABLE MAGNETIC AREAS INDICATIVE OF POSSIBLE STRUCTURES

readings, usually of about one gamma for each 30 feet of displacement; thus giving evidence of the throw of the fault as well as its direction and hade.

In establishing base magnetic stations, usually at the county seat in each county, the federal government has accurately determined the vertical and horizontal magnetic forces at each station. By computing and applying this data as shown on Figure 7, it is possible to establish favorable and unfavorable structural trends. In many cases this data affords "leads" which on detailed magnetometer work prove to be closures indicative of definite structure. For instance it is very apparent that the area south of Jackson is very interesting, since it is a strong high surrounded by magnetic lows.

A properly operated magnetometer can make 80 to 100 stations a week on regional work, with an accuracy of plus or minus 5 gammas; such stations are usually placed at intervals of 1 mile, so that it is possible to regionally cover 100 square miles per week. On detailed work, where an accuracy of plus or minus 1 gamma is required, 40 to 50 stations per week can be made; such detailed work is usually done to a density of between ½ and ¼ of a mile. The cost of magnetometer work is between $300 and $400 per week.

Gravity Method

From the point of view of volume of work done, gravity has always been the most popular form of geophysical work; and the present intensive exploration of Mississippi constitutes no exception to this rule. In fact, it is said that the Mississippi strike has set an all-time high for attracting the greatest number of gravity meters in the shortest length of time. Within a few days after the Tinsley

FIGURE 6

Magnetic picture of Mississippi Piercement Type Salt Dome.

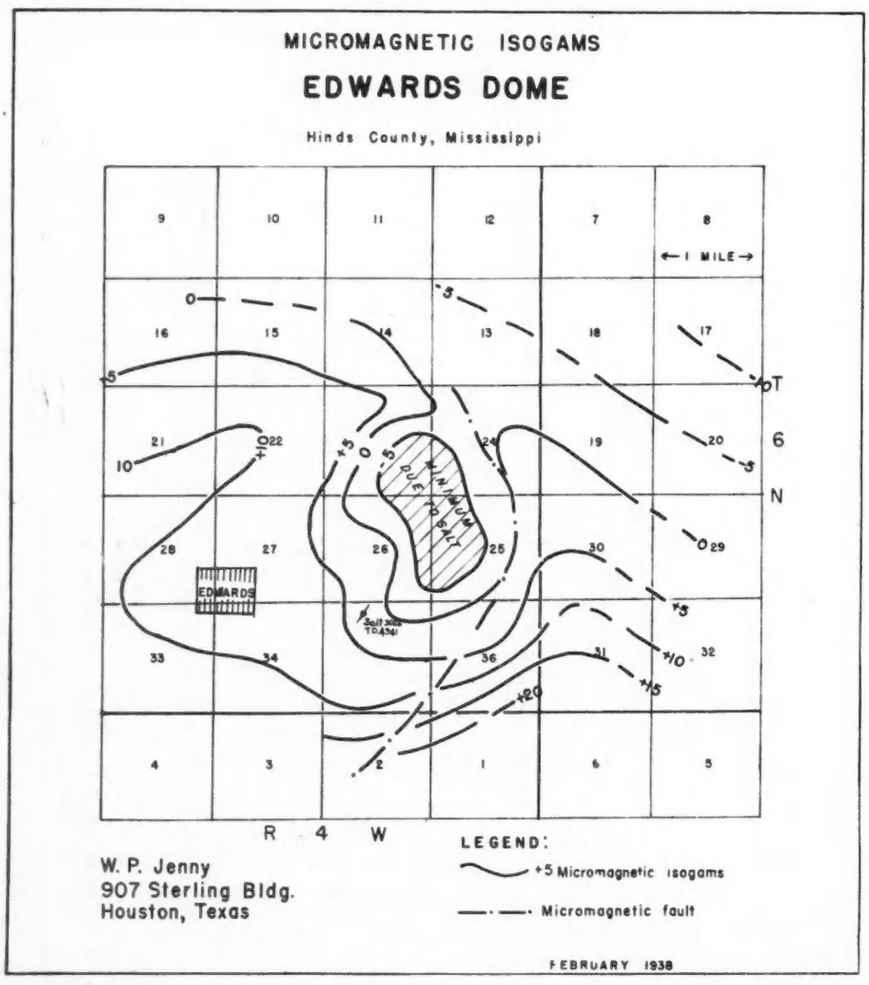
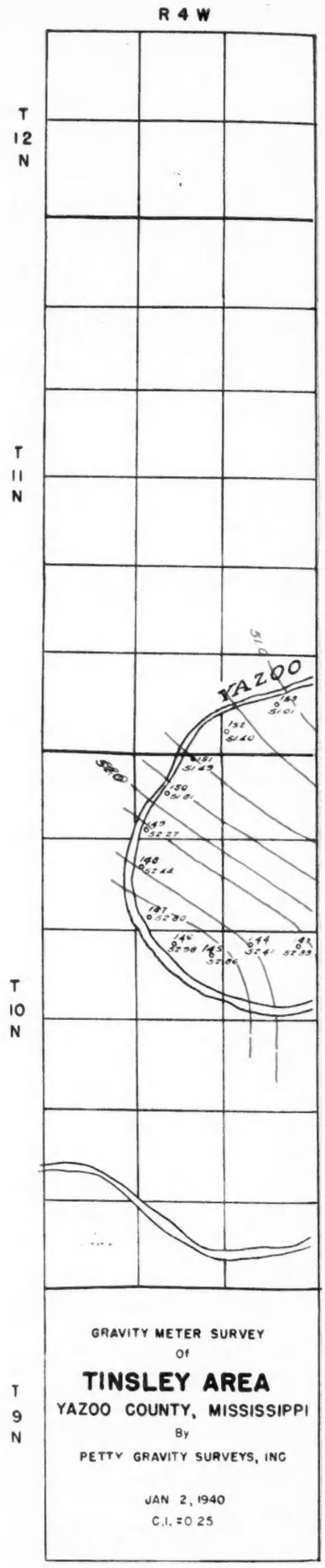
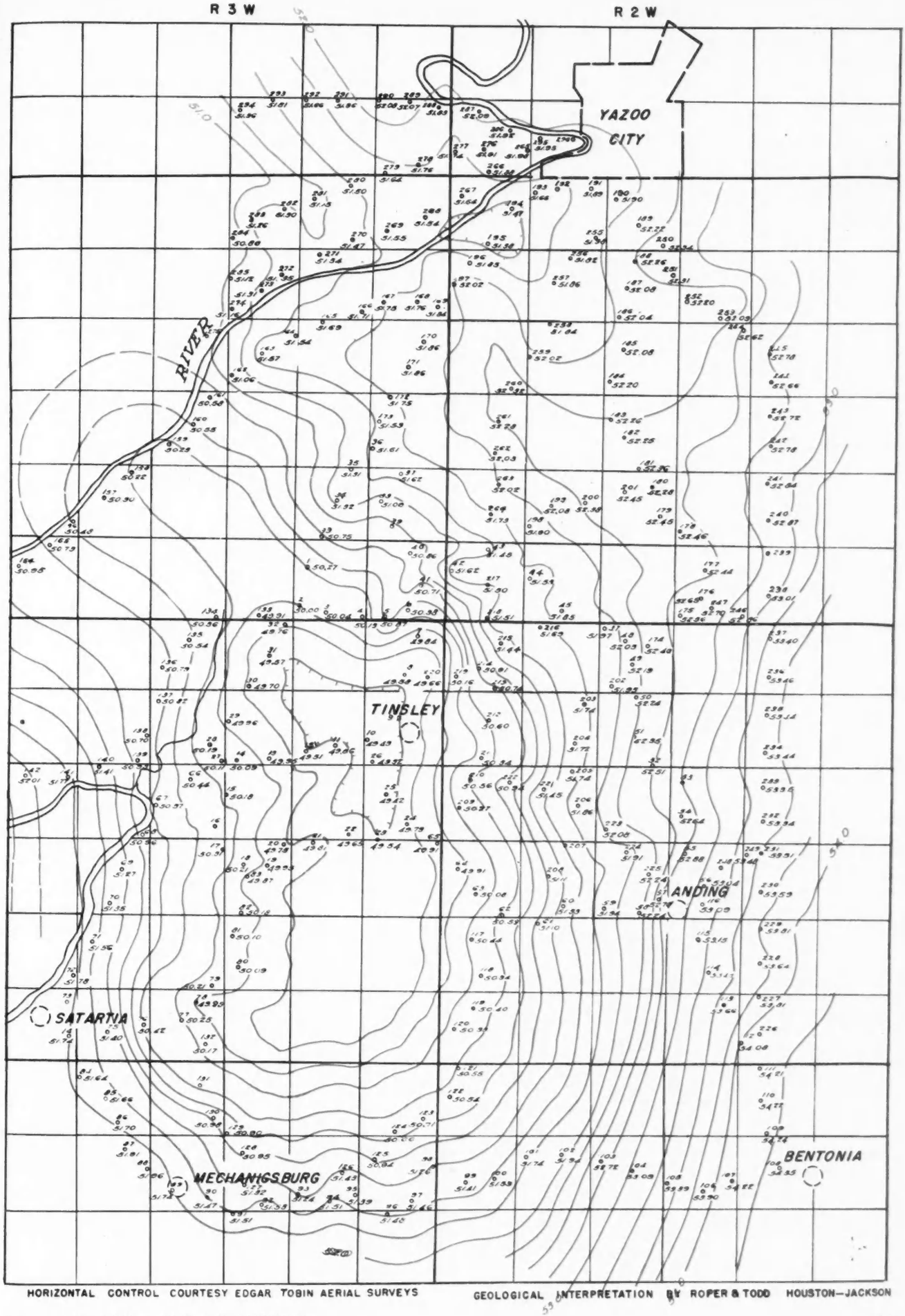


FIGURE 8





HORIZONTAL CONTROL COURTESY EDGAR TOBIN AERIAL SURVEYS

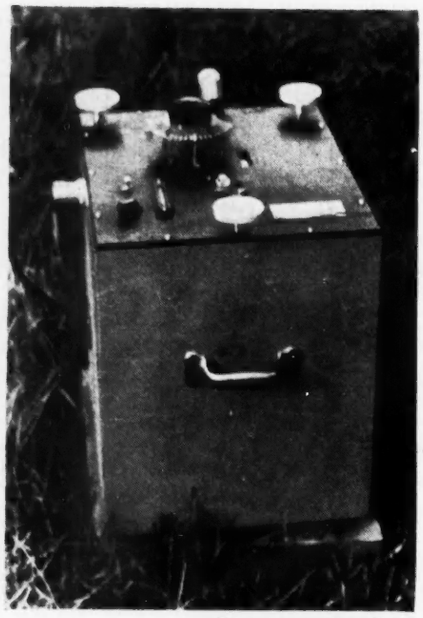
GEOLOGICAL INTERPRETATION BY ROPER & TODD HOUSTON—JACKSON

discovery the gravity parties began to flock in. And since that time a minimum of 30 gravity parties has been at work in the state. Almost every contract concern and most of the company operated departments are represented in this millidyne hunt.

The gravity method commends itself for reconnaissance purposes because it is both fast, and cheap, and quickly delineates favorable areas in which to concentrate further exploratory effort. By use of a regional gravity survey it is possible to get a good outline of the regional geological features, to locate most of the local structures, and to eliminate 75 percent of the acreage from further consideration. In this elimination of uninteresting acreage, the gravity meter approaches 100 percent in accuracy; where there is no gravity anomaly there is rarely ever a structure. While the gravity method is conclusive in its negative import, it is by no means so accurate on the positive side; every gravity anomaly is by no means a structure. The explanation of the gravity anomalies which are not structures, lies in the theory of the method: the study of gravity is a study of forces, not the study of just one force. Several forces often conflict to give a misleading result, and the diagnosis of these psuedo-anomalies is the chief interpretative problem of gravity work.

Essentially all gravity meters work on the same principle; they all consist of weighing a weight at different points on the earth's surface and recording the differences in the weight recorded. The size of the mass weighed varies in different meters between 5 grams and 300 grams, depending on the size and construction of the meter. All meters are very sensative to temperature variations, and the temperature on all are controlled within a range of 1/1000 of a degree. Practically all modern gravity meters give accurate results, and the survey of any area with any number of different type of meters will give substantially the same results. Some meters have slight advantages in speed or for detail work, but all get accurate, reliable results. The best gravity meters can now be read to well below 1/10 of a millidyne.

The technique of getting gravity data has far outrun the technique of understanding gravity data. In fact the real problem in gravity work is the interpretation of the



—Picture courtesy Ray Gravity Surveys.

Modern gravity meters are much smaller, now measuring 14 inches by 16 inches by 18 inches; weigh but 70 pounds. But are very rugged and satisfactory for rough field use.

results obtained; and the technique of interpreting gravity results is as yet a highly personal one. While we anticipate little further progress in the field of taking gravity data, the field of interpreting gravity data is very much in the development stage. The result is, that in the future years the gravity readings now being taken may tell us lots more than they do now.

However, it is now possible through regional gravity work to outline the ridges and basins within the area covered by the gravity grid. It gives definite ideas on the location of the basement material or of the older, denser rocks, and thus throws light on the thickness of the sedimentary section which controls the ultimate possibilities of any area. And such a gravity survey will clearly indicate the interesting structural points, from which the future oil fields will come in that area.

In the "minima country" (that part of the state where structures will show up as gravity lows, due to the presence of salt under the structure) the gravity contrast over structures will be very sharp and easily perceived. The character of this gravity contrast is clearly illustrated in Fig. 8, which shows the character of the gravity pattern in the vicinity of the Tinsley oil field. The structural significance is there self evident, and this can be classed as a Grade A gravity anomaly. Other anomalies as strong and clear as this one are expected to be found, but few that are any better than this one are expected. The area covered by this gravity survey on the Tinsley field indicates the amount of territory that can be covered in one week by the modern gravity party on detail work.

In the "maxima country" (where the structures show up as gravity highs due to the heavier old beds being pushed up nearer to the surface) the contrast of gravity over the structures will be much less pronounced, and will present more difficulties of interpretation.

With the modern gravity meter it is possible to take a reading, move a half mile, and take another reading in 3 to 5 minutes. As many as 1000 stations a month are being secured by crews operating in Mississippi, and the problem is more one of surveying than of getting the gravity data. The elevations of all gravity stations must be accurately surveyed in, since an error of one foot in elevation produces serious errors in the gravity results. Where an area is hilly, wooded, and the roads are winding (as is the case with much of Mississippi) the surveying of elevations is very slow and it frequently requires three engineering crews to keep up with one gravity meter.

Using a normal reconnaissance density and operating on fair roads, it is possible to survey 250,000 to 300,000 acres per month in sufficient detail to indicate the regional geology and to show up most of the structures. The cost of a gravity crew, with two surveying units, is $4000 a month. It is said that most of the gravity work being done in Mississippi is costing the operator between 1 and 2 cents an acre.

In the rugged, wooded country that Mississippi is, results are being obtained with the gravity meter that could never have been hoped for with the torsion balance. In fact the excellent gravity results being obtained in Mississippi may prove to be but the beginning of the first real effective exploration of the Southeastern States.

Seismic Method

The theory of reflection seismograph work is much more complex than the gravity or magnetic methods, but is quite understandable when reduced to lay terms.

A small charge of dynamite is

You can eat your cake and have it---

that's what gas has proved to oil, as re-pressuring brings old sands to life again.

Because Gas needs the help of Valves to work its magic, we remind Oil Men that READING-PRATT & CADY are on the job.

The partial view of a Gas plant in Texas illustrates the point —the READING-PRATT & CADY 8-in. and 6-in. Iron Body Gate Valves being completely satisfactory in the service for which we recommend them.

You will find our recommendations aimed just as directly at what you want. Check with us on valves for Gas Lines; Boiler Feed Water and Steam Lines; Pipe Lines; Refinery Lines; Filling Lines; Lines for Heavy Oils, Sludge and Asphalt.

READING-PRATT & CADY

READING-PRATT & CADY DIVISION · BRIDGEPORT·CONNECTICUT

AMERICAN CHAIN & CABLE COMPANY, Inc.